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UNIVERSITY OF OKLAHOMA
GRADUATE COLLEGE

SELF-DETERMINATION THEORY AS A MODEL FOR MOTIVATION IN A TRAINING CONTEXT

A Dissertation

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

Doctor of Philosophy

by

Jason E. Jones
Norman, Oklahoma
2002

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MODEL FOR MOTIVATION IN A TRAINING CONTEXT

A Dissertation APPROVED FOR THE
DEPARTMENT OF
EDUCATIONAL PSYCHOLOGY

BY

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This dissertation is dedicated to the memory of Janice Haase. Jan's example of hard work and love for God and family will live on for many generations.

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ABSTRACT

As billions of dollars are spent annually on employee training, designers and instructors are continuing to look for ways to increase training efficiency and effectiveness. Prior research has demonstrated the importance of trainee motivation. However, little research has been conducted to help explain training motivation and understand its origins. This study examines Self-Determination Theory as a framework to explain motivation in a training setting. The relationships between motivation, self-regulation, perceived autonomy support, perceived competence, general causality orientation, basic needs, and learning outcomes were investigated in a job-training context.

One-hundred and seventeen moderately educated employees of a large organization participated in a 3-week training program. The program was designed to teach each student how to troubleshoot and repair electrical problems in large machinery. Motivational variables were measured during the training program by 6 questionnaires. Achievement was measured by 3 declarative knowledge-based examinations and 3 procedural knowledge-based examinations that were administered throughout the training program. Correlation and regression analyses were used to analyze the data.

The information from this study will aid training designers and instructors in the development of training curriculum and environments that will increase levels of training motivation, learning, and performance. Implications for training research and practices will be discussed.

CHAPTER I

Statement of the Problem

It is an understatement to say that employee training is an important part of workplace progress. Small businesses, corporations, and organizations rely on training to help employees gain new knowledge. Without the opportunity to continue developing new declarative and procedural knowledge, employees will fall behind the knowledge and expertise of their competitors. The lack of knowledge will slow productivity and reduce employee output. In recent years training has become more important with the recent expansion of organizational information and technologies.

A number of organizations have instituted continual learning policies. Many professions such as medicine, therapy, engineering, and law have license requirements for continual learning. This trend is based on the fact that learning does not end at the graduation from formal education. Additional education is required to keep professionals abreast of new information and at peak performance.

As recently as 1996, in the United States alone, more than $210 billion dollars was spent on employee training annually (O'Connor, Bronner, & Delaney, 1996). This figure suggests the need for considerable research to support training effectiveness. Business officers, as well as training managers, continue to search for methods to help employees acquire vast amounts of knowledge in as little time as possible. Concurrently, instructors are seeking ways to motivate students to listen intently, comprehend information, and proceduralize the knowledge as efficiently and cost effectively as possible. Without the understanding of human motivation and how motivation affects training environments, poor productivity and the loss of large amounts of time and money

will result. Additional research on motivation in training, however, can be put to practical use to save companies, schools, and organizations time and money.

Training is interested in the principles that guide learning and the acquisition of applicable skill (Patrick, 1992). Goldstein (1980) defined training as "the acquisition of skills, concepts or attitudes that result in improved performance in an on-the-job situation" (p. 230). Smith and Ragan (1999) refer to training as "those instructional experiences that are focused upon individuals acquiring very specific skills that they will normally apply almost immediately " (p. 3).

The above definitions distinguish *training* from *learning* alone. Learning is not the only component of training. Training should also have a goal or objective to improve some type of specific performance (Patrick, 1992). Training, therefore, provides a tangible outcome of knowledge that can be observed, measured, or assessed.

Although training is one of the largest development expenditures of corporations, research has indicated that a large number of training programs "fail to result in significant, lasting, new behavior on the job" (Jackson, 1985, p.70). Consequently, training directors and organizational leaders continue to search for ways to design and develop training programs that lead to more effective learning and skill development.

Past training research has focused on methodology and learning environments that maximize trainee learning (Tannenbaum & Yukl, 1992). Research focused on method and setting resulted in outcomes that were explained by the influence of individual trainee differences and has led researchers to examine how personal characteristics relate to training effectiveness (Campell, 1988; Tannenbaum & Yukl, 1992).

Several theoretical models suggest that learning and skill acquisition are influenced by trainee variables such as ability, motivation, and personality (Baldwin & Ford, 1988; Mathieu, Tannenbaum, & Salas, 1992; Noe, 1986). This study is focused on understanding the motivational characteristics of learners that influence learning in a training environment. Past training motivation research will be reviewed and then the theory of self-determination will be discussed and investigated to provide an additional model of training motivation.

The present study addresses motivational influences on workplace training. The purpose of this study is to investigate the relationships between self-determination variables and learning outcomes in an adult training environment. More specifically, the purposes of this study are to (1) describe the influence of motivational variables on training outcomes; and (2) to determine whether the assumptions of self-determination theory (SDT) are applicable for the explanation of motivation in training contexts.

This study investigates SDT as a framework to explain motivation in a training setting. The information from this study will aid training designers and instructors in developing training curriculum and environments that will increase levels of training motivation, as well as learning and performance.

The literature review begins in chapter 2 with a review of intrinsic and extrinsic motivation research, highlighting studies that have investigated motivation in learning environments. Next, I will review the literature that has focused on motivational antecedents and their effects on training outcomes. Self-determination theory will also be reviewed, including reviews of each of the four subtheories (cognitive evaluation theory, organismic integration theory, basic needs theory, and causality orientation theory). At

the end of chapter two the literature review will be reviewed and research hypotheses for this study will be stated.

In chapter 3 the methodology specifically is described in detail addressing the participants, context, procedure, and measures used in the study. Chapter 4 will present a comprehensive overview of the statistical analysis and results. And finally, chapter 5 discusses the findings and addresses limitations and research implications.

Chapter II

Literature Review

Motivation

Motivation involves a person's energy, direction, and persistence towards identified goals or intentions (Ryan & Deci, 2000). The concept of motivation is important to many fields that involve human behavior including psychology, education, athletics, medicine, religion, and business. Therefore, motivation is an important concern to those in roles of leadership such as managers, teachers, coaches, clergy, parents, and healthcare providers (Ryan & Deci, 2000).

Motivation is not a simple construct and is not easy to define. Motivation is composed of many factors and causes. People are motivated by different outcomes, needs, and consequences. For example, one person may be motivated to do well and learn as much as possible in a job training class, while another is happy to pass the course with minimal effort. This example demonstrates two differing types of motivation, intrinsic and extrinsic, that should be defined at this point because they have been found to be critical for understanding human behavior.

Intrinsic Motivation

Intrinsic motivation describes the natural tendency toward mastery, curiosity and exploration that is a foundation for cognitive and social development (Csikszentmihalyi & Rathunde, 1993; Ryan 1995). Intrinsic motivation is built upon the enjoyment of the activity alone and is not related to any external reward for the behavioral outcome. Intrinsic motivation is the result of choice and a belief in an internal locus of control (Ryan & Deci, 2000). Intrinsic motivation comes from a person's valuing of a task and a

belief about one's ability to manage behaviors and outcomes (Bandura, 1986; Deci & Ryan, 1985a).

Research has shown that individuals who are intrinsically motivated to engage in a behavior have reported feeling enjoyment and satisfaction (Deci & Ryan, 1985b; Ryan, 1982; Weiner, 1985). Other researchers have found intrinsically motivated individuals to report feelings of competency (Ryan, 1982; Weiner, 1985) and an internal locus of causality (Thomas & Velthouse, 1990).

Intrinsic motivation has consistently been found to relate to better learning (Benware & Deci, 1984; Elliot & Dweck, 1988) and performance (Elliot & Harackiewicz, 1994). Benware and Deci (1984) found intrinsically motivated university students to be more actively engaged in learning than students who were not intrinsically motivated. Additionally, the intrinsic students enjoyed the experiment more and demonstrated better conceptual understanding of the material. Also, Elliot and Harackiewicz (1994) found intrinsically motivated children to be better performers than extrinsically-motivated and achievement-oriented children while playing a pinball game.

Extrinsic Motivation

Extrinsic motivation, on the other hand, is motivation based upon performing an activity in order to gain some external reward (Ryan & Deci, 2000). For example, a child might read a book for the purpose of having the information to make a good grade on an examination, rather than for the enjoyment of reading the story. This extrinsically-motivated child is interested in an external reward for reading the book. Although intrinsic motivation has been found to be a superior motivational orientation, most activities people engage in are extrinsically motivated (Ryan & Deci, 2000b).

Research has found extrinsically-motivated individuals have fewer desired outcomes in learning settings than their intrinsically-motivated counterparts. Garbario (1975) found that individuals who were approaching a task with extrinsic motivation showed more rigid behavior in task engagement, impatience, and learned less than their intrinsically motivated peers.

Training Motivation

Training motivation is defined, for the purpose of this study, as "the direction, intensity, and persistence of learning-directed behavior in training contexts" (Colquitt, LePine, & Noe, 2000, p. 678). Several studies have investigated the influence of motivation on training outcomes (Mathieu et al., 1992; Gist, 1989; Noe & Schmitt, 1986). The literature on training motivation suggests that motivation is influenced by both situational and individual characteristics (Mathieu et al., 1992; Gist, 1989; Noe & Schmitt, 1986). Such characteristics include personality, self-efficacy, manager support, and peer support. The literature also suggests that higher levels of motivation are directly related to better learning and greater achievement.

Personality characteristics, which are defined as relatively stable characteristics of an individual that influence cognitive functioning and behavior (Colquitt et al., 2000), have also been found to influence learning motivation. Individual personality characteristics including cognitive playfulness, achievement motivation, internal locus of control, positive affectivity, and competitiveness have all been positively linked to training motivation (Martocchio & Webster, 1992; Mathieu, Martineau, & Tannenbaum, 1993; Noe, 1993; Bretz & Thompsett, 1992; Mumford, Baughman, Uhlman, Costanza, &

Threlfall, 1993). Anxiety, on the other hand, has been found to negatively influence training motivation (Webster & Martocchio, 1993; Noe & Schmit, 1986).

Self-efficacy, which is an individual's "belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997 p. 3), has been found to be positively related to both motivation and learning outcomes (Miller, Brehens, Greene, & Newman, 1993; Martocchio & Webster, 1992; Mathieu et al., 1992). A study by Gist and Mitchell (1992) showed self-efficacy to be positively related with task choice, task effort, and persistence in task achievement.

Manager support and peer support are both situational characteristics that have been found to influence employee motivation. Facteau, Dobbins, Russell, Ladd, and Kudisch (1995) found a positive direct relationship between manager support and motivation to learn. Birdi, Allan, and Warr (1997) also found a positive relationship between manager support and increased development, as well as increased on- and off-job learning.

In summary, the research shows sufficient evidence that both individual and situational characteristics affect self-efficacy, effort, persistence, development, and motivation for learning. The research suggests that instructors and instructional designers must take into consideration both individual and situational characteristics as they develop instructional materials and present training.

Self-Determination Theory

I will use self-determination theory (SDT) and associated subtheories as a way to explain the phenomenon of motivation in the training environment and to provide a framework for instructional development that will foster motivated and self-determined

trainees. Ryan and Deci's (2000) SDT is based on the assumption that all people naturally seek psychological growth. This theory assumes that humans continually seek to master challenges and integrate their experiences to develop a personal identity (Ryan & Deci, 2001). They refer to a dialectical process whereby the social context and the active organism interact to influence human behavior.

According to SDT, human motivation can be understood and studied by employing an organismic meta-theory that points out the importance of a person's inner resources for personality development and self-regulation (Ryan, Kuhl, & Deci, 1997). SDT seeks to understand people's developmental tendencies and core needs that are considered to be the foundation of their self-motivation. SDT explains healthy development and living with the concept of basic psychological needs. These needs are considered to be innate, universal, and essential for healthy development and well-being (Deci & Ryan, 2001).

Self-determination theory views behavior to be the result of three types of motivational subsystems. The three subsystems include the intrinsic substystem, the extrinsic subsystem, and the amotivational subsystem (Deci, 1980). As seen in Figure 1 the intrinsic motivational subsystem is related to behavior that is self-determined or chosen, while the extrinsic motivational subsystem is related to automatized or automatic helpless behavior that is the result of external consequences.

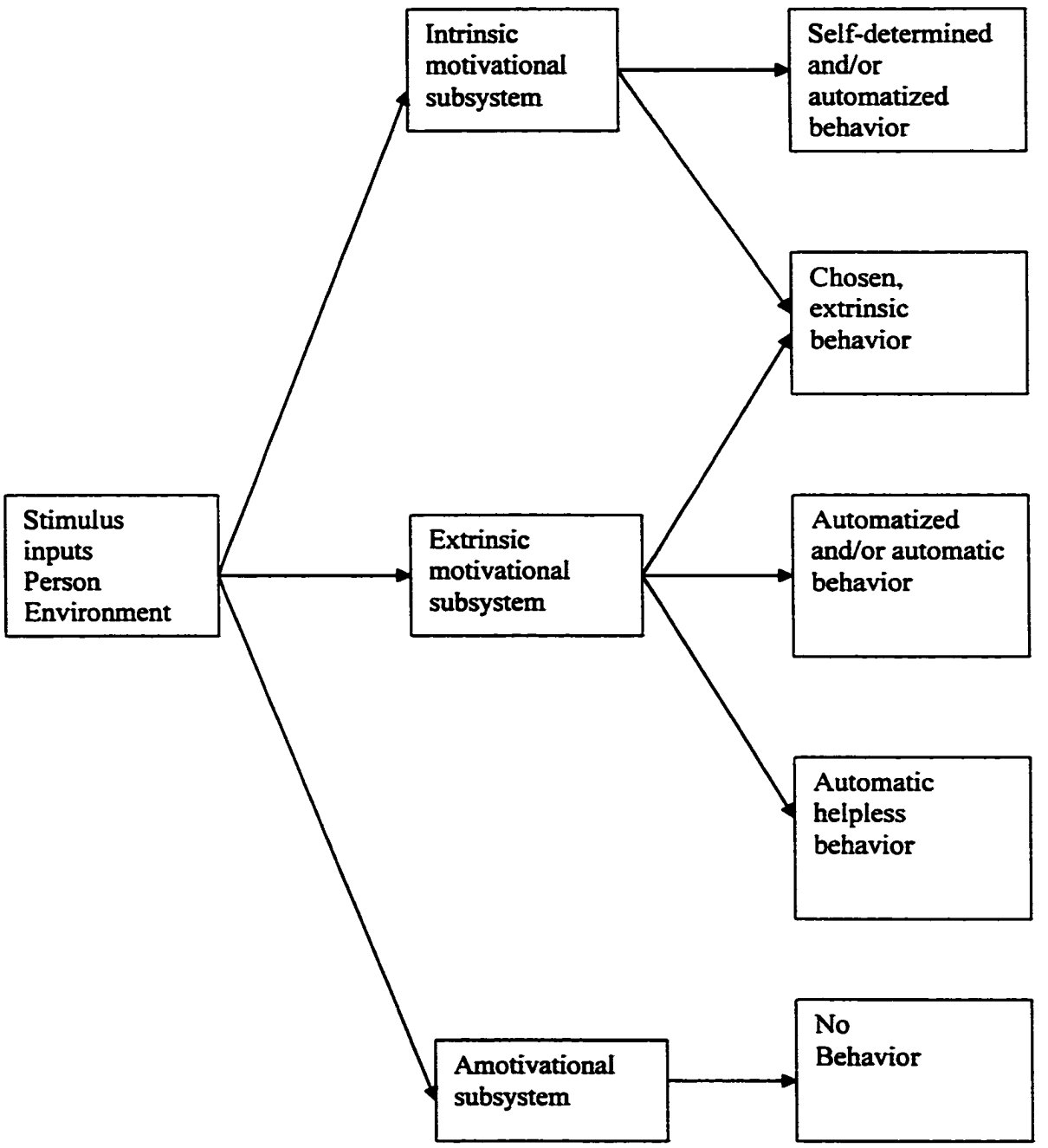


Figure 1. *The relationships between behavior and motivational subsystems. Deci (1980)*

Self-determination theory has evolved over the last 30 years as a general theory of motivation. The theory is based upon four subtheories that were developed to explain motivational phenomena that has emerged from research findings (Ryan & Deci, 2001). The four subtheories include cognitive evaluation theory, organismic integration theory, causality orientations theory, and basic needs theory.

Cognitive Evaluation Theory

Cognitive Evaluation Theory (CET) was proposed to account for situational factors that influence a person's intrinsic or extrinsic motivational functioning. Cognitive evaluation theory explains the two processes that affect intrinsic motivation. First, locus of causality is evaluated by an individual. The individual seeks to understand whether the cause of an outcome is external or internal in origin. If an individual perceives the locus of causality to be internal, one feels control over his behaviors and is self-determined, thus behavior is intrinsically motivated. On the other hand, if causality is perceived as external, an individual will feel less self-determined and will exhibit extrinsically motivated behavior (Deci & Ryan, 1980).

The second process by which one's intrinsic motivation is affected by situational factors involves a change in perceived competence. When an individual's experiences lead to the perception of competence, one will be more intrinsically motivated. Likewise, when an experience leads to incompetent feelings, one will be less intrinsically motivated.

Cognitive evaluation theory is concerned with perceptions of competence, autonomy, and accompanying feelings. Deci and Ryan (1980) asserted that "perceptions of causality and competence are cognitive components of underlying shifts of

motivational processes"(p. 41). Therefore, an individual in the presence of external control and external rewards will shift from intrinsic motivation to extrinsic motivation. When an individual perceives an internally controlled environment, one will feel more autonomous and will exhibit self-determined behaviors (Deci & Ryan, 1980).

Several studies have examined the effects of using external reward on human motivation. Deci (1972) was one of the first to study the effects of extrinsic reward. Deci compared the effects of contingent reward ($1 for each puzzle solved), non-contingent reward ($2 for participating in the experiment), and no rewards. His findings revealed that students who were given contingent rewards were less intrinsically motivated to complete the puzzles as compared to students who were given no rewards or given non-contingent rewards (Deci, 1972).

Other studies have sought to replicate Deci's findings by using other types of rewards such as verbal feedback or symbolic tokens. Many of these experiments support Deci's findings (Levine, Broderick, & Burkart, 1983; Rosenfield, Folger, & Adelman, 1980; Weiner, 1980). Some studies, however, have not supported Deci's case that extrinsic rewards have a detrimental effect on intrinsic motivation (Fisher, 1978; Pritchard, Campbell, & Campbell, 1977).

Deci (1971) explained that the detrimental effect of extrinsic motivation lies in the meaning of the information carried by the reward rather than just the administration of a reward. Ryan (1982) supported this assumption with a study that involved rewards that were attached with competence or controlling information. The participants were told that the rewards would be based on how well they were performing the task. The results

showed that the rewards which carried a meaning that reflected competence and a sense of control lowered intrinsic motivation.

A meta-analysis conducted by Deci, Koestner, and Ryan (1999) examined 128 studies that examined the effects of extrinsic rewards on intrinsic motivation. This investigation yielded strong data that confirms Deci and Ryan's theory. All extrinsic rewards significantly undermined intrinsic motivation. The meta-analysis revealed that tangible rewards were more detrimental to children than college students, while verbal rewards were less beneficial to children than college students (Deci, Koestner, & Ryan, 1999).

A study by Zuckerman, Porac, Lathin, Smith, and Deci (1978) examined the relationship of autonomy on intrinsic motivation as asserted by cognitive evaluation theory. This investigation studied 80 undergraduate university students who were paired and given a puzzle to solve. One student in each pair was allowed to choose what puzzle to work on and how long to work on the puzzle, while the second student was assigned a puzzle and a time limit. The puzzle and allotted time assigned to the second student was the same as chosen by the first student of the pair. Results revealed that students who felt more autonomy felt greater control than subjects who had no choice. Students who had a choice were found to have spent an average of 259.4 seconds working on their puzzle, while student who were assigned a puzzle spent an average of 164.9 seconds on solving the puzzle. This difference revealed a large discrepancy of motivated behavior, whereas the students with choice were found to be significantly more intrinsically motivated.

Studies by Deci (1972), Levine et al. (1983), Rosenfield et al. (1980), Weiner (1980), Ryan (1982), and Zuckerman et al. (1978) provided evidence that levels of

autonomy and competence affect student learning. In these studies, higher levels of perceived autonomy and competence resulted in higher levels of motivation or performance. No studies, however, have investigated the effects of trainee perceived autonomy and perceived competence in an adult job training context.

In summary, cognitive evaluation theory suggests that social environmental settings can facilitate or hinder motivation by thwarting a person's innate psychological needs. Intrinsic motivation can be affected by perceived autonomy and perceived competence. Therefore, those who feel they will not perform successfully or who do not feel a sense of independence will more likely be extrinsically motivated or not motivated at all to participate in the task.

By applying cognitive evaluation theory to training contexts, one should see that if trainees perceive the locus of causality to be internal, they will be more likely to be intrinsically motivated. If the trainee perceives the locus of causality to be external, extrinsically motivated behavior will occur, and the trainee will feel less self-determined. Additionally, when a trainee has a low level of perceived competence, extrinsically oriented motivation will be exhibited. Therefore a trainee's perceptions of causality and competence are cognitive components that will determine changes in motivation.

This proposed study seeks to investigate the effects of perceived autonomy and perceived competence on motivation and achievement outcomes in a training course. The information gained from this study will provide instructors and instructional designers with knowledge about how to develop training environments that will foster higher levels of motivation and achievement. Based on the above review of literature, I hypothesize

that perceptions of competence and autonomy support in the learning environment will significantly influence motivation and achievement.

Organismic Integration Theory

Deci and Ryan (1985) introduced a sub-theory of SDT theory called Organismic Integration Theory (OIT). While cognitive evaluation theory explains the impact of extrinsic rewards and a person's perception of competence within an environment on motivation, Deci and Ryan introduced OIT to explain the relationship between differing forms of motivation and self-regulation, which are a result of personal and environmental factors. This theory explains the different forms of extrinsic motivation and the factors that either encourage or hinder internalization and integration of the regulation for the behaviors (Deci & Ryan, 1985). At this point in the literature review, research on self-regulation will be presented since it is a component of OIT.

Self-Regulation. There are several theories of self-regulation (Bandura, 1991; Carver & Scheier, 1981; Klein, 1989), most of which have similar features, which include goal setting, monitoring, cognitive strategy use, and self-evaluation. For this study, self-regulation from the social-cognitive perspective, proposed by Bandura (1986), will be the focus.

Self-regulation is an important process leading to the development of knowledge, acquisition of new skill, and performance on complex tasks (Kanfer & Ackerman, 1989). Self-regulation is a cognitive activity of initiating and actively progressing toward one's own goals. Self-regulation is a process of specific activities such as processing and integrating knowledge, rehearsing, and attending to instruction that lead to a defined goal

(Schunk, 1989). In learning, self-regulation involves a student's initiative and progression toward specific learning goals (Zimmerman, 1989).

In social-cognitive theory, self-regulation is comprised of three subprocesses: self-observation, self-judgment, self-reaction (Bandura, 1986). In the educational setting, each sub-process works to interact with one another to attain a specific goal or outcome (Schunk, 1989).

Self-observation is the process of being fully aware of one's self. When students participate in self-observation, they think about what goals they would like to accomplish. A person's observation is what informs and motivates. The information can then be used to set a plan for specific behaviors. When a person records his behavior and uses this observation to motivate action, self-observation has occurred (Schunk, 1989).

Goals are an important part of the observation process. In self-regulation, goals are viewed as the driving force of regulation and have been found to influence performance (Latham & Locke, 1991). Several studies have supported the benefits of setting goals that maintain the direction of behavior (Bandura & Cervone, 1986; Latham & Locke, 1991)

Self-judgment, which is the second component of self-regulation, involves the comparison of present performance with one's goal outcome (Schunk, 1989). Self-judgment is critical to self-regulation because it allows a person to evaluate performance against a criterion that has been identified beforehand. It is this monitoring process that is key to regulating one's own behavior. Self-judgment is aided by proximal goals. The proximal goal allows a person to continually monitor himself throughout the task of reaching distal goals. Accurately set proximal goals keep the goal setter on track to

eventually meet the ultimate distal goal. Stock and Cervone (1990) argued that proximal goals serve as highly effective self-regulators that affect performance in a number of ways. They found that the assignment of proximal goals increased the person's self-efficacy for completing the task. They also found that attaining proximal goals positively affected self-evaluative reactions. It was also discovered that people with proximal goals persisted on the task significantly longer than people who had not been assigned proximal goals.

Self-reaction, the third and final stage of the self-regulation loop, is concerned with the belief one has about one's performance. A person's belief about one's goal process has a motivational effect on behavior (Bandura, 1986). Schunk (1989) noted that a person's belief of making progress toward one's goal will increase self-efficacy. It is this belief that sustains motivation to complete the task. Self-reaction motivates the goal pursuer to either continue with planned activities or implement new strategies to meet the goals.

This framework serves to create a reciprocal loop of goal-directed behavior. A goal or standard is compared with the person's current state. If there is no discrepancy between the current state and the person's objectives that moves him towards his goal, then the regulatory process continues as usual with no modification to the current goal attainment strategy.

Training in self-regulation teaches people to assess their problems, to set specific concrete goals in relation to those problems, to self-monitor environmental helpers or hinderers, and to administer rewards or penalties for progression toward or away from goals. Those who learn to be self-regulated learn to observe their own behavior, to

compare behavior to desired goals, and to administer rewards and punishments that bring about and sustain commitment to their goals (Latham & Locke, 1991).

There are many benefits of being self-regulated. Self-regulation fosters goal setting and evaluation skills. Goal setting in itself has been found to be a highly beneficial activity. In the industrial setting, Latham and Kinne (1974) found that producers who supervise employees and set production goals have higher productivity than producers who supervise people who do not set production goals. Research also shows that employees trained in goal setting increase production and decrease absenteeism (Latham & Kinne, 1974). Frayne and Latham (1987), likewise, found absenteeism to be reduced after employees received training in goal setting during self-regulation education. Hollenbeck and Williams (1987) also found that salespeople who engaged in greater monitoring had higher sales performance.

Self-regulation strategies have also been found to have a significant influence on learning and performance (Miller et al., 1993; Pintrich & DeGroot, 1990). Cognitive strategies that are involved in the self-regulation process include organization, goal setting, and self-evaluation. Such cognitive strategies have been found to foster learning and improvement performance (Campbell, 1991; Weinstein & Meyer, 1986). A study by Miller et al. (1993), examined student cognitive strategy use and learning and found students who engaged in self-regulatory behaviors were found to score higher on a statistics examination than those who did not use self-regulated cognitive strategies.

Increased self-efficacy is another benefit of self-regulated behavior. Self-efficacy, a concept of Bandura's (1986) social-cognitive theory, refers to task specific self-confidence. Self-efficacy is measured by asking participants whether they believe

they can attain each of a graded series of performance levels and by having them rate their degree of confidence in attaining each level. Research has found that self-efficacy toward a task increases if the person is using self-regulated strategies such as proximal goal setting and self-monitoring (Bandura & Schunk, 1981). Research also shows that self-efficacy has a powerful effect on task performance itself (Bandura, 1986).

Increased satisfaction has been found to result from involvement in self-regulated behavior. Because self-regulation increases performance, it also increases satisfaction. Locke and Latham (1990) found a significant positive correlation between degree of success and satisfaction across 16 studies that reported correlation coefficients. Other benefits of self-regulation include increasing interest, reducing boredom (Latham & Kinne, 1974), reducing role conflict and ambiguity, and increasing performance (Locke & Latham, 1990).

Self-regulation is an important construct in the theory that guides the present study. According to SDT, regulation will have a direct relationship with motivation, performance, competence, relatedness, autonomy, and autonomous causality orientation personality. Research has sought to examine how differing motivation orientations (extrinsic and intrinsic) influence patterns of learning and behavior (Bandura & Schunk, 1981). Recent studies have suggested that motivational orientation of an individual can create a model from which a person interprets and responds to events.

While examining the relationship between cognitive engagement (i.e., meta-cognitive self-regulation strategies) and motivation, Meece, Blumefeld, & Hoyle (1988) found that students who reported higher levels of intrinsic motivation exhibited greater

active cognitive engagement than their peers who reported being less intrinsically motivated.

Additionally, Pintrich & DeGroot (1990) found that intrinsic motivation was positively related with the use of self-regulatory strategies (e.g., organization, rehearsal, elaboration), meta-cognition, and effort control in educational activities. Thus, more intrinsically motivated individuals were found to be more likely to report greater use of self-regulated behaviors, including strategy use, better monitoring, and more extensive goal-setting.

Ryan and Deci's (2000b) OIT uses a continuum to show that extrinsic motivation can be broken up into 4 separate regulatory styles. The difference between the regulatory styles is attributed to autonomy. Motivated behaviors cover the continuum from amotivation to intrinsic motivation and correspond with the hypothesized regulation styles as seen in figure 2.

Motivation	Amotivation	Extrinsic				Intrinsic
Regulatory Styles	Non-Regulation	External Reg.	Introjected Reg.	Identified Reg.	Integrated Reg.	Intrinsic Reg.
Perceived Locus of Causality	Impersonal	External	Somewhat External	Somewhat Internal	Internal	Internal
Relevant Regulatory Processes	Nonintentional, Nonvaluing. Incompetence Lack of Control	Compliance, External, Rewards & Punishments	Self-control, Ego-Involv. Internal Rewards & Punishments	Personal Importance, Conscious Valuing	Congruence, Awareness, Synthesis with self	Interest, Enjoyment, Inherent Satisfaction

Figure 2. The Self-Determination Continuum Showing Types of Motivation with Corresponding Regulatory Styles, Locus of Causalit

The least autonomous behavior is associated with external regulation, which has a perceived external locus of control. This type of behavior is performed for external reasons such as rewards, avoiding punishment, and compliance. For example, a student might complete an assignment because he has been warned by his teacher. In this case, the behavior is carried out to avoid a punishment or a negative consequence. Because the behavior is not self-determined the student exhibits a low level of regulation.

Introjected Regulation is characterized by the "taking in of a regulation behavior but not fully accepting it as one's own" (Ryan & Deci, 2000, p. 72). Behaviors are performed to avoid personal or internal punishment such as guilt or anxiety. Individuals with this affiliation may perform to satisfy ego needs or to avoid punishment. Regulation at this level is characterized by an individual imposing constraints and rewards upon one's self, rather than by someone else. For example, a student might study the night before the exam in order not to feel guilty. In this case, the student's beliefs and self-imposed pressure is standing in the way of self-determined and truly intrinsic behavior.

The next form of regulation that corresponds with a higher level of extrinsic motivation is termed "identified regulation." This type of behavior is internally regulated in a self-determined way, even though external rewards will result. The person views the actions as important and as having meaning and value (Ryan & Deci, 2000). An example would be students who read ahead of the assigned reading in a history book because they believe this will help them do better in the class. In this case students have chosen to behave in a way that they feel will be beneficial to

them. This type of regulation also results in students feeling a sense of direction and purpose, rather than obligation to execute a behavior (Vallerand & Bissonnette, 1992).

The most autonomous form of extrinsic motivation is integrated regulation. Integrated regulation refers to engaging in regulation because the behaviors have been "evaluated and integrated with one's own needs and values" (Ryan & Deci, 2000, p. 73). The chosen behavior in this case is extrinsically motivated by a person's life activities and goals (Vallerand and Bissonnette, 1992). An example would be students who chose to study for an exam and forego a football game because doing well in school is more important to them than a game. At this stage of regulation, self-determination is found at its greatest level for extrinsically motivated behaviors (Vallerand & Bissonnette, 1992). Although identified and integrated regulation seem similar in many aspects to intrinsic regulation, they are still considered extrinsic because the behaviors are motivated by external consequences.

Using the OIT as a framework can help one better understand the differing levels of regulated behavior by providing a typology to classify such behavior. As integration of the task behavior increases, self-regulated behavior also increases. There are several studies that support this theory. For example, Ryan and Connell (1989) found evidence of this continuum when they investigated achievement behaviors in children and found each regulatory style to be inter-correlated.

A number of other studies have found that more autonomous extrinsic motivation was associated with engagement, better performance, and higher quality learning (Connell & Wellborn, 1991; Miserandino, 1996; Grolnick & Ryan, 1987).

Research conducted in several diverse fields such as physical exercise and religion has also provided evidence that favorable outcomes are associated with more internalized motivation (Chatzisarantis, Biddle, & Meek, 1997; Ryan, Rigby, & King, 1993).

Deci, Eghrari, Patrick, and Leone (1994), studied 192 introductory psychology students to investigate the assertions of OIT. The authors hypothesized three social-contextual facilitating factors that would support self-determination. The facilitating factors included providing meaningful rationale, acknowledging the behaver's feelings, and conveying choice. Using an experimental design in which all three factors were manipulated, the authors acquired data that supported their hypotheses. Findings revealed that social context can support self-determination and integration. Accordingly, data showed that when the context does not support self-determination, introjection occurs (Deci et al., 1994). This study supports organismic integration theory's claims that social context influences internalization processes and regulatory styles.

Vallerand and Bissonnette (1992) investigated the relationship between behavioral persistence and intrinsic motivation, extrinsic motivation, and amotivation. The participants consisted of 1042 first-term junior-college students who were enrolled in a compulsory college course and who were given questionnaires to assess motivation. The results of the study revealed that students who persisted in the course (did not drop the course) had reported being more intrinsically motivated, more identified, and more integrated than students who dropped out of the course (Vallerand & Bissonnette, 1992).

In another related study, Black and Deci (2000) examined the effects of instructor's autonomy support on student motivation in an organic chemistry class. Two-hundred and eighty-nine organic chemistry students were assessed to measure autonomy support and self-regulated behavior, perceived competence, interest, causality orientation, and grade orientation. Results found that students who perceived their instructor to be more autonomy supportive had higher levels of autonomous self-regulation, higher levels of perceived competence, higher levels of interest, and lower levels of anxiety. Students who exhibited higher levels of autonomous self-regulation also had high levels of performance in the course. Furthermore, instructor autonomy support was also found to be a direct predictor of student performance (Black & Deci, 2000).

Studies by Meece et al. (1988), Pintrich and DeGroot (1990), and Vallerand and Bissonnette (1992) provided evidence of the relationship between motivation and self-regulation levels. Likewise, studies by Connell and Wellborn (1991), and Black and Deci (2000) provide evidence of the positive relationship between autonomy, self-regulation and motivation. The studies by Black and Deci (2000) and Miserandino (1996) and Grolnick and Ryan (1987) reported a positive relationship between motivation and achievement. According to the research, people who feel more autonomous in the learning environment are identified with more positive types of motivation, such as extrinsic-identified, extrinsic-integrated, and intrinsic, and exhibited higher levels of self-regulated behavior.

By applying OIT to training contexts one should see that trainees who are trained in an autonomy supportive environment will score higher on extrinsic-

identified motivation or intrinsic motivation measures. Also, trainees with higher scores on extrinsic-identified motivation and intrinsic motivation measures should exhibit higher levels of self-regulated behavior and achievement than trainees who report lower motivation.

Because OIT describes a person's self-regulated behavior as external, introjected, and identified, this study will label the corresponding motivation types as extrinsic-external motivation, extrinsic-introjected motivation, and extrinsic-identified motivation. Vallerand, Pelletier, Blais, Briere, Senecal, and Vallieres, (1993) have also used this means of labeling types of motivation.

The present study investigated four of the six types of motivation that have been introduced in OIT. The four types of motivation included extrinsic-external, extrinsic-introjected, extrinsic-identified, and intrinsic motivation. Amotivation, which is the state of no motivation, was not addressed because this study was interested in understanding why a person is extrinsically or intrinsically motivated and relationships between motivation and achievement. Also, extrinsic-integrated motivation was not addressed because no questionnaire was available to measure this type of motivation and because of the similarities between the extrinsic-identified motivation and extrinsic-integrated motivation.

In sum, a number of studies have been conducted to test OIT and provide evidence of the significant effects of autonomy and self-regulation on motivation and achievement (Meece et al., 1988; Pintrich and DeGroot 1990; Vallerand and Bissonnette, 1992; Black and Deci, 2000; Miserandino, 1996; and Grolnick and Ryan, 1987). However, no studies have investigated these issues within a technical

job-training context with performance outcomes. The addition of this research will provide additional evidence for OIT and provide trainers and instructional designers with information that will guide the development of more motivation-enhancing and effective training. Based on the review of literature in OIT, I hypothesize that positive relationships will be found between perceived autonomy, self-regulation, extrinsic-identified motivation, extrinsic-introjected motivation and achievement

Basic Needs Theory

The third subtheory within SDT is basic needs theory. Basic needs theory posits three basic psychological needs that are necessary for psychological well-being. The three needs include, autonomy, competence, and relatedness. Basic needs theory posits these needs as being "innate, essential, and universal."(Ryan & Deci, 2000b, p. 74) This theory asserts that need satisfaction is critical to personal fulfillment.

Basic needs theory defines needs as "innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being" (Deci & Ryan, 2000, p.229). This theory views competence, relatedness, and autonomy as needs that are at the core of humanity. The satisfaction of these needs will greatly affect achievement and fulfillment (Deci & Ryan, 2000). Basic needs are differentiated from the perceived autonomy support and perceived competence by its global nature. A person's basic needs are viewed as a person's overall competence, autonomy, and relatedness throughout all domains of life. Thus, basic needs theory maintains that well-being can occur only when these needs are satisfied.

Self-determination theory asserts that human needs must be addressed when investigating and studying goal-directed behavior and development. Furthermore, SDT asserts, through basic needs theory, that needs are the psychological foundation for goals and influence regulatory processes.

According to SDT, needs are important parts of intrinsic motivation. Deci & Ryan, (2000) explain " Intrinsically motivated behaviors are those that are freely engaged out of interest without necessity of separable consequences, and, to be maintained, they require satisfaction of the needs for autonomy and competence." (p. 233). The main assumption that has directed basic needs theory is that intrinsic motivation will be fostered by conditions that satisfy these basic needs, whereas conditions that hinder need satisfaction will undermine intrinsic motivation and self-determination (Deci & Ryan, 2000).

Many studies have supported the influence of autonomy and competence on intrinsic motivation (see cognitive evaluation theory in the review of literature). Field studies performed in schools and organizations continue to support autonomy and competence as being associated with positive outcomes, intrinsic motivation, increased satisfaction, and well-being (Deci, 1971; Deci & Cascio, 1972; Ryan & Grolnick, 1986; Deci, Connell, & Ryan, 1989). Deci & Cascio, (1972) found autonomy to be essential to intrinsic motivation when events such as threats led to the undermining of intrinsic motivation.

A number of studies have also demonstrated relatedness to be influential to intrinsic motivation. SDT hypothesizes that intrinsic motivation will increase in contexts where students perceive a high level of relatedness (Ryan & La Guardia,

2000). Anderson, Manoogian, & Reznick, (1976) found that children who participated in an interesting activity in the presence of an adult who was ignoring them, displayed a low level of intrinsic motivation. Likewise, Ryan & Grolnick (1986) found that students who perceived their teachers as being warm and caring showed greater intrinsic motivation than their peers without a positive perception.

Intuition may lead one to underestimate the importance of relatedness as a need because of the many activities people participate in and intrinsically enjoy on their own. However, SDT views the need of relatedness as a "distal support" for intrinsic motivation that provides a person with a sense of security. In the words of Deci & Ryan (2000), "A secure relational base appears to provide a needed backdrop—a distal support—for intrinsic motivation, a sense of security that makes the expression of this innate growth tendency more likely and more robust" (p. 235).

Studies by Deci (1971), Deci and Cascio, (1972), Ryan and Grolnick (1986), Deci et al. (1989) and Deci and Cascio (1972) provide a great deal of evidence for the positive relationship between autonomy and competence, intrinsic motivation and positive outcomes in a learning environment. Studies by Anderson, et al. (1976) and Ryan and Grolnick (1986) lend support to the positive relationship between relatedness and motivation.

Within a training context, basic needs theory would assume that trainees who have satisfied needs would exhibit extrinsic-introjected, extrinsic-identified, and intrinsic motivation and higher levels of achievement. No studies, however, have been conducted to investigate the relationship between basic needs and trainee motivation in a job-training context. Such an investigation will provide instructors

and instructional designers with knowledge about the effects of basic needs on trainee motivation and achievement. On the premises of basic needs theory and the research that supports its notions, I hypothesize that a significant positive relationship will be found between basic needs (autonomy, competence, and relatedness) and student extrinsic-identified motivation, extrinsic-introjected motivation, intrinsic motivation and achievement.

Causality Orientations Theory

Causality orientation theory, the fourth sub theory, asserts that intrinsic motivation is influenced by environmental evaluations and personality orientations. This theory suggests that a person's personality characteristics, as well as one's environmental factors will influence the operation of particular motivational subsystems. Differences between people's responsiveness to change subsystems can be attributed to individual personality characteristics (Deci & Ryan, 1980). Causality orientation theory asserts three types of personality orientations that tend to be stable across domains.

Autonomy orientation refers to people who have a general belief that their behaviors and outcomes are related and are a result of their own initiations. These people believe they have the ability to control the outcome of their own behavior. A person with this personality orientation usually exhibits intrinsic motivation (Deci & Ryan, 1980).

A person with the general belief that behaviors and outcomes are related and that behaviors are controlled by external means have a control orientation. This

person perceives an external locus of causality in life. People with this orientation primarily operate with external subsystems of motivation (Deci & Ryan, 1980).

The third personality orientation, impersonal orientation, is found in a person who generally believes that behaviors and outcomes are not related. Furthermore, this person believes that one's own behaviors and initiatives are not instrumental to the attainment of desired results (Deci & Ryan, 1980).

Research conducted by Deci and Ryan (1985b) found autonomous orientation to be positively related to self-esteem, self-actualization, and ego development. Vallerand, Blais, Lacouture, & Deci (1987) again found autonomous orientation to be positively related to self-esteem and self-actualization. Controlled orientation and impersonal orientation, however, were both found to be related to negative attributes including coronary-prone behavior, social anxiety, and depression (Deci & Ryan, 1985). In a study conducted by Williams & Deci (1996), medical students who reported having an autonomous causality orientation also had higher psychosocial beliefs and reported more autonomously motivated reasons for participating in the course.

Applying causality orientation theory to a training setting leads one to assume that trainees with a higher level of autonomous causality orientation will have more positive levels of extrinsic motivation or intrinsic motivation. Trainees who have higher level of autonomy causality orientation will also exhibit greater achievement than trainees who have lower levels of autonomy causality orientation.

Although, prior investigations have provided support for the relationship between causality orientations and motivation, no studies have investigated the

relationships between trainee causality orientation, motivation and achievement within a job-training context. Such an investigation will provide instructors with knowledge that will enable the prediction of trainee achievement. Additionally, instructor knowledge of causality orientation effects will lead them to provide interventions within the course that will foster a change in a trainee's orientation, which will lead to a higher level of motivation and achievement.

Based on the literature reviewed, I hypothesize that trainees with a more autonomous-oriented personality will have higher scores on extrinsic-introjected, extrinsic-identified, intrinsic motivation, and they will show greater achievement than trainees with lower levels of autonomy orientation.

Overview of Study

Given the evidence presented in the literature review, the tenants of SDT were investigated in an adult training context. Although SDT has been shown to be an effective model of motivation in fields such as counseling, athletics, religion, health and education (Ryan and Deci, 2000), it has yet to be used as a model to predict performance outcomes in an adult job-training environment.

A large number of studies have been conducted to examine the effects of individual differences on motivation to learn (Miller et al., 1993; Deci 1972; Zuckerman et al. 1978; Deci et al., 1989; Williams & Deci, 1996). Most of these investigations, however, have been in school and university environments using children or college students. A number of studies have also been conducted in the training field that address outcome and achievement prediction from measures of motivation (Colquitt et al., 2000; Mathieu et al., 1992; Noe & Schmitt, 1986).

However, the field of training has provided very little research that gives an explanation of how motivation can be fostered in training contexts.

This study will investigate individual differences and types of motivation that will provide for better understanding of motivation in a training setting. This study will also provide evidence that self-determination theory can be used as a framework for understanding the foundation and origins of motivation in a training context. The hypotheses of this study are stated in Table 1.

Table 1.

Hypotheses In Relation to Their Theoretical Origin.

Theory of Origin	Hypothesis
Cognitive Evaluation Theory	1. Positive correlations are expected between perceived competence and perceived autonomy support, with extrinsic-identified, extrinsic-introjected, intrinsic motivation, and achievement.
	2. Negative correlations are expected between perceived competence, perceived autonomy support with extrinsic-external motivation.
	3. Regression analysis should show that perceived autonomy support and perceived competence will differentially predict the four types of motivation.
	4. Regression analysis should show that perceived autonomy support and perceived competence will predict achievement.
Causality Orientation Theory	5. Positive correlations are expected between autonomous causality orientation with extrinsic-identified, extrinsic-introjected, intrinsic motivation, and achievement.
	6. A negative correlation is expected between autonomous causality orientation and extrinsic-external motivation

Table 1 (Continued)

Theory of Origin	Hypothesis
	7. Regression analysis should show that autonomous causality orientation should differentially predict the four types of motivation.
	8. Regression analysis should show that autonomous causality orientation should predict achievement.
Basic Needs Theory	9. Positive correlations are expected between need of autonomy, need of competence, need of relatedness with extrinsic-identified, extrinsic-introjected, intrinsic motivation, and achievement.
	10. Negative correlations are expected between need of autonomy, need of competence, need of relatedness with extrinsic-external motivation.
	11. Regression analysis should show that the need of competence, the need of relatedness, and the need of autonomy should differentially predict the four types of motivation.
	12. Regression analysis should show that the need of competence, the need of relatedness, and the need of autonomy should predict achievement.

Table 1 (Continued)

Theory of Origin	Hypothesis
Organismic Integration Theory	13. When self-regulation is the dependent variable, the four motivation variables will explain significant variance, though greater contributions should be made by intrinsic and extrinsic- identified motivation. 14. When achievement is the dependent variable, both self-regulation and the motivation variables should make significant, unique contributions to explained variance.

Chapter III

Methodology

Participants

The sample for this study consisted of 117 adults between the ages of 18 and 65 years. Less than one percent of the sample was between the age of 18 and 24. Just over 4 % of the sample was between the ages of 25 and 29 years. Twenty-one percent of the sample was between the ages of 30 and 39 years. The largest age group (48.7%) was found to be between the ages of 40 and 49 years. Twenty-four percent were 50 years of age or older. Caucasians constituted 67.5% of the sample, while 17.1% were African-Americans. Just over 7% were Asian and 6% were Hispanic.

Each adult was involved in a workplace-training program that taught trainees how to troubleshoot a malfunctioning machine. The author approached 14 training classes, consisting of 196 students, with a video taped presentation that introduced the study. The instructor of the class also explained the process of the study and answered student questions. The training classes that were approached were randomly selected and consisted of approximately 96% males and 4% females from various ethnic backgrounds and differing parts of the United States. Each participant spent three weeks at the training center where trainees were taught in a classroom and a simulated working environment. Each participant understood that the training was a requirement for his or her job position. The participation rate was 71%. All participants were treated in accordance with ethical standards of the American Psychological Association (American Psychological Association, 1992).

Measures

The paragraphs below describe each instrument that was used in the study. All instruments, except the demographic survey, have been used in various investigations and have yielded reliability coefficients ranging from .75 to .94.

Demographics

A demographics questionnaire (see Appendix A) was used to collect general participant information including, age, gender, educational level, home office location, experience in training, position held, and tenure at the organization.

Perceived Autonomy Support

Participant perceived autonomy support was measured by the Learning Climate Questionnaire (LCQ) (Williams and Deci, 1996) (see Appendix B). Fifteen items measured each participant's perception of the autonomy support relating to his or her instructor within the training context. Each item was measured on a Likert scale from 1 (corresponding with strongly disagree) to 7 (corresponding with strongly agree). Each question asked the trainees about the degree to which their instructor supported their autonomy (e.g., "My instructor made sure I really understood the goals of the course and what I need to do."; "I am able to be open with my instructor in class."). Reliability of this measure has been found to be satisfactory. For example, in a recent study by Black and Deci (2000) this instrument yielded very high internal consistency (α= .93 and .94). This instrument has been used in several studies to test assertions of self-determination theory (Black & Deci, 2000; Williams. Saizow, Ross, Deci, 1997; Williams and Deci, 1996).

Perceived Competence

A perceived competence measure was acquired by administering the Perceived Competence Scale (PCS) (see Appendix C). The PCS is a short, 4-item questionnaire that assesses participant feelings of competence about learning the material and achieving the goals of the class (e.g., "I am able to meet the challenge of performing well in this course."). Williams and Deci (1996) and other researchers have used this measure and found internal consistency to be above .80.

Motivation Scale

The Academic Motivation Scale (Vallerand, et al., 1993) (AMS) is the English version of the "Echelee de Motivation en Education" (EME) instrument used in France and Canada that is based on the tenets of self-determination theory and is composed of seven subscales assessing three types of intrinsic motivation, three types of extrinsic motivation, and amotivation (see Appendix D). This instrument was validated by Vallerand et al. (1993) yielding an alpha of .80 and adequate stability (a mean test-retest correlation of .75) over a one month period. Construct validity was also supported through a series of correlation analyses among the seven scales. This instrument was modified to the training environment to measure the level of motivation of each participant. Although the scale gives a measure of 7 types of motivation (amotivation, extrinsic-external, extrinsic-introjected, extrinsic-identified, intrinsic-to know, intrinsic- for stimulation, and intrinsic-accomplishment), this study will only use the measures of, extrinsic-identified, extrinsic introjected, extrinsic-external, and intrinsic motivation. The intrinsic motivation variables (intrinsic-to know, intrinsic-accomplishment, and intrinsic- for stimulation) were combined to

form one overall measure of intrinsic motivation since only one global variable was of interest to this study.

Self-Regulation

A self-regulation questionnaire (SRQ) was administered to measure levels of self-regulation (see Appendix E). The measure was constructed by Jones and Greene (2001) and consists of 17 items that provide an overall measure of self-regulated learning behavior in a learning environment. Each item on the questionnaire asks the participant to respond to a statement about his or her study habits using a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). This questionnaire was administered by Jones and Greene (2001) and yielded a sufficient internal reliability coefficient of .84. along with evidence for validity.

Needs

The Basic Psychological Needs Scale (BPNS) is a family of scales that address the needs of autonomy, competence, and relatedness in one's general life, and in specific domains. Two sub-scales including "Basic Needs Satisfaction in Life" and "Basic Needs Satisfaction at Work" were used to measure need satisfaction (see Appendix F). The basic needs scale for work was slightly adapted to refer to the training environment. The two sub-scales combined have 42 items that use a 7-point Likert scale (from 1-"not at all true" to 7- "very true"). Items on the questionnaire involve statements about a person's need satisfaction (e.g., "I feel pressured in my life." and "My feelings are taken into consideration in training."). This scale has been validated by several studies investigating needs and motivation (Deci & Ryan, 2000; LaGuardia, Ryan, Couchman, & Deci, 2000)

General Causality Orientation

Each subject's causality orientation was measured by the General Causality Orientation Scale (GCOS) (Deci & Ryan, 1985). This scale assesses the strength of three different motivational orientations within an individual (see Appendix G). First, autonomy orientation measures the extent to which a person is oriented toward self-initiation, seeks interesting activities, and takes responsibility for his or her own behavior. The second orientation, controlled, assesses the extent to which people are oriented toward being dependent on rewards and are more interested in the demands of others rather than what they want for themselves. Third, the impersonal orientation measures the extent to which a person feels ineffective, has no sense of being able to affect outcomes, and perceives achievement being a matter of luck.

The GCOS (Deci & Ryan, 1985) was administered with 12 vignettes containing 36 items. The only change that was made to this instrument was a modification of the format that provided consistency across all questionnaires. Each vignette described a social-oriented or achievement-oriented situation (e.g. interacting with a friend or being offered a new position at work) and was followed by 3 types of responses (an autonomous, controlled, or impersonal type). The participants indicated how each response was typical of themselves by using a 7-point Likert scale. This instrument has been found to be reliable (α=.75, test-retest = .74 over two months) by Deci & Ryan, (1985).

Achievement

Achievement was measured by 3 written examinations and 3 task examinations given throughout the course. The written examinations consisted of 25

multiple-choice questions (4 possible choices) pertaining to vocabulary, procedures, and guidelines related to industrial electrical troubleshooting. The task examinations were measured using a checklist of task objectives in a laboratory setting. The trainee performed the training task while being observed by the course instructor. The course instructor assessed the students' use of correct procedures as they examined the laboratory machinery for problems. Each of the 6 examinations resulted in a point score from 0 to 50. All 6 examinations were combined to yield a total course score. This score was used as the achievement measure in this study.

Procedure

Training Context

Participants were from various regions of the United States and employees of a large organization. A large portion of the employees of this organization receive their training at this location. Due to the large amount of employees needing to be trained and the participative nature of the course, the class size was limited to no more than 15 students.

Students were required to attend class 3 hours each day and participate in laboratory practice for another 3 hours each day. Students were given 1 hour for lunch and an additional hour for private study time. Therefore, the trainees were involved in a training program for seven hours a day for three weeks (fifteen days). Data were collected from participants of 14 classes that were taught concurrently over a 12-week period of time.

The course content encouraged student independence while learning, but provided an instructor to answer questions or help any student who was having

trouble. The organization encouraged trainees to be involved in team activities with their classmates. Teambuilding activities such as ropes course, volleyball, basketball, and softball were available to the trainees. Additionally, the organization made available a health center that consisted of cardiovascular and weight machines, a gymnasium and a full-time nurse and trainer. Each trainee had the option to get a health screening and a personalized workout plan while at the training facility.

Course content

The purpose of the training course was to teach basic industrial electrical troubleshooting skills to the organization's machinery technicians. The trainees were taught procedures to safely troubleshoot electrical problems of large machinery. The large machinery is an important component of this organization's business, therefore it is important for this organization to train a large number of technicians to troubleshoot problems to repair and to maintain hundreds of machines around the country.

The training included classroom instruction provided by the course instructor and hands-on training in a machine laboratory. During the laboratory training phase, each participant was matched up with a machine and was required to use his knowledge to troubleshoot the electrical problem. To troubleshoot the machinery, the trainee used a systematic procedure taught in the classroom. Although students were encourage to work on their own, an instructor was available for questions and guidance.

Students began training on a Monday and ended training on a Friday after 15 business days. During the first week, students learned to understand circuit plans and

test circuits. During the second and third weeks, the trainees learned how to troubleshoot system problems. Six examinations were given throughout the training process. A written examination was administered every Thursday totaling three written exams. A performance examination was administered every Friday to assess procedural knowledge. A total of three performance examinations were given.

On Friday of the first week (day 5) after the first two examinations had been given, the instructor explained the study being conducted and answered questions from the class. Each trainee was informed that his or her participation in the research project was voluntary, and there would be no penalties if they chose not to participate. Participants were compensated with a local museum coupon good for half price admission. A manila envelope containing the questionnaires was distributed to the students, and they were informed that the questionnaires were to be completed during their free time. Each participant was also notified that the questionnaire packets would be picked up during class on Wednesday, day 8. The timing of the administration allowed all students to experience one week of training and two examinations with feedback prior to the completion of the instruments.

After the study was introduced, the instructor informed the students that the course would proceed as usual. Each student was also told that the examinations were standardized assessments constructed by the training organization. The organization has analyzed all examinations to ensure test validity and reliability. All questionnaires and examinations were tracked using a confidential number that was written on each questionnaire and on all examinations. Table 2 details the administration of measures.

Table 2.

A Detailed Schedule of the Administration of the Measures.

Day of Training	Measures Given	Activities
Day 4	Written Examination 1	
Day 5	Performance Examination 1 All Questionnaires	Orientation Notify of deadline
Day 8		Trainees Return Questionnaires
Day 9	Written Examination 2	
Day 10	Performance Examination 2	
Day 14	Written Examination 3	
Day 15 Training	Performance Examination 3	Final Day of

CHAPTER IV

Results

Prior to analysis, the data were reviewed for data entry accuracy, outliers, and missing values. Twelve participants, who were missing more than 20% of the data, were omitted from the data set. This left 117 participants in the sample. A total of 15 scale items with missing values were substituted with the mean for that item.

Subscale Reliability

Cronbach Alpha reliability coefficients were calculated for each scale to ensure internal consistency. Alpha reliability was found to be sufficiently high for all measures ranging from .60 to .95 (see Table 3 for subscale alpha coefficients).

Subscale Intercorrelations

Pearson's Product Moment correlations (reported in Table 4) were calculated to examine the relationships between variables and address Hypotheses 1, 2, 5, 6, 9, and 10 (see table of hypotheses on page 33). The following relationships partially supported Hypothesis 1. Perceived competence was found to have significant positive relationships with achievement, perceived autonomy support, basic need of autonomy, self-regulation, extrinsic-external motivation, extrinsic-identified motivation, and intrinsic motivation. Perceived autonomy support was found to relate positively with basic need of autonomy, basic need of competence, basic need of relatedness, self-regulation, perceived competence, extrinsic-external motivation, extrinsic-introjected motivation, extrinsic-identified motivation, and intrinsic motivation. Perceived autonomy support was found to be negatively related to amotivation. However, no relationship was found between perceived competence and

extrinsic-introjected motivation. Also, no relationship was found between perceived autonomy support and achievement. The strongest relationship occurred between perceived autonomy support and intrinsic motivation.

As hypothesized autonomous causality orientation was found to have significant positive relationships with perceived competence, self-regulation, basic need of autonomy, basic need of competence, basic need of relatedness, extrinsic-introjected motivation, extrinsic-identified motivation, and intrinsic motivation. Hypothesis 5 is supported by these relationships with the exception of the positive relationship found between autonomous causality orientation and extrinsic-external motivation, which is also contrary to hypothesis 6. Additionally, no relationship was found with achievement. Due to the positive relationships found between perceived competence and perceived autonomy support with extrinsic–external motivation, there is no support for Hypothesis 2.

Basic need of autonomy was found to be positively correlated with perceived autonomy support, self-regulation, intrinsic motivation, basic need of competence, and basic need of relatedness. As anticipated, basic need of competence was positively related to perceived competence, perceived autonomy support, self-regulation, basic need of autonomy, and basic need of relatedness. Basic need of relatedness was found to be correlated positively with the basic need of competence and basic need of autonomy variables. Additionally, all three basic need variables were found to be negatively related to amotivation.

The correlational analysis does not fully support Hypothesis 9. The only component of Hypothesis 9 that is supported is the relationship between basic need

for autonomy and intrinsic motivation (.192). Contrary to the hypothesis, basic need of autonomy was found to be negatively related to achievement. Hypothesis 10 was not supported as extrinsic-external motivation was not found to be negatively related to the basic need of autonomy, basic need of competence, and basic need of relatedness.

As expected, positive correlations were found between self-regulation and perceived competence, perceived autonomy support, basic need for autonomy, basic need for relatedness, extrinsic-introjected motivation, extrinsic-identified motivation, and intrinsic motivation. However, the above variable's positive relationship with extrinsic-external motivation was not expected. Self-regulation's positive relationships with perceived competence, and the motivation variables are consistent with prior self-regulation research (Pintrich & DeGroot, 1990; Meece et al., 1988; Bandura & Schunk, 1981). It is also important to note the stronger relationships found with extrinsic-identified motivation and intrinsic motivation. Also as expected, self-regulation was found to be negatively correlated to amotivation. Extrinsic-external motivation was found to have significant positive relationships with perceived competence, perceived autonomy support, self-regulation, autonomous causality orientation, basic need for relatedness, extrinsic-introjected motivation, extrinsic-identified motivation, and intrinsic motivation. As expected, extrinsic-external motivation was found to be negatively related to achievement.

Also expected were the positive relationships found between extrinsic-introjected motivation and autonomous causality orientation, self-regulation, perceived autonomy support, extrinsic-identified motivation, and intrinsic motivation.

As hypothesized, extrinsic-identified motivation was positively related to perceived competence, perceived autonomy support, self-regulation, autonomous causality orientation, basic need of autonomy, basic need of relatedness, extrinsic-external motivation, extrinsic-introjected motivation, and intrinsic motivation. A negative relationship was found between extrinsic-identified motivation and amotivation.

Also expected, were the positive correlations between intrinsic motivation and perceived competence, perceived autonomy support, self-regulation, autonomous causality orientation, basic need of autonomy, basic need of relatedness, extrinsic-introjected motivation, and extrinsic-identified motivation. The positive relationship found between intrinsic motivation and extrinsic-external motivation (see table 4) was not expected.

Table 3.

Descriptive Statistics for all Subscale

Subscale	Alpha	Mean	Max	SD	N	N of Iems
1. Perceived Competence	.94	6.21	7	1.05	117	4
2. Self-Regulation	.83	3.75	5	.47	117	17
3. Autonomy Support	.95	5.72	7	1.02	117	15
4. Basic Need Autonomy	.65	5.61	7	.67	117	6
5. Basic Need Competence	.60	5.26	7	.61	117	6
6.Basic Need Relatedness	.81	5.38	7	.55	117	7
7. Intrinsic Motivation	.94	4.49	7	1.34	117	12
8. Extrinsic-Identified Mot.	.72	5.07	7	1.19	117	4
9. Extrinsic-Introjected Mot.	.87	4.02	7	1.72	117	4
10. Extrinsic-External Mot.	.81	4.25	7	1.55	117	4
11. Amotivation	.65	1.39	7	.69	117	4
12. Auto. Causality Orient.	.71	4.41	7	.56	117	1
13. Achievement		263.35	300	22.54	117	150

Table 4.

Pearson Product Moment Correlations Among Subscales

	Written Score	Skill Score	Total Score	Perceived Competence	BN Autonomy	BN Competence	BN Relatedness	Amotivation
Written Score	-	.670**	.944**	.208*	-.264**	-.084	-.078	-.008
Skill Score	.670**	-	.877**	.142	-.132	-.024	-.134	.035
Total Score	.944**	.877**	-	.198*	-.229*	-.065	-.110	.010
Perceived Comp.	.208*	.142	.198*	-	.120	.273**	.115	-.102
BN Autonomy	-.264**	-.132	-.229*	.120	-	.562**	.592**	-.210*
BN Competence	-.084	-.024	-.065	.273**	.562**	-	.563**	-.307**
BN Relatedness	-.078	-.134	-.110	.115	.592**	.563**	-	-.220*
Amotivation	-.008	.035	.010	-.102	-.210	-.307**	-.220*	-

Table 4. (Continued)

	Written Score	Skill Score	Total Score	Perceived Competence	BN Autonomy	BN Competence	BN Relatedness	Amotivation
Extrinsic-External	-.131	-.227*	-.185*	.195*	.166	.121	.264**	-.140
Extrinsic-Introjected	-.037	-.035	-.039	-.007	.098	-.140	.086	-.032
Extrinsic-Identified	-.057	-.134	-.096	.223*	.111	.045	.233*	-.234
Intrinsic Motivation	-.077	-.116	-.102	.199*	.192*	.131	.252**	-.299**
Autonomy Support	-.003	-.106	-.049	.197*	.310**	.331**	.488**	-.306**
Self-Regulation	.100	-.071	.033	.223*	.291**	.331**	.431**	-.288**
Auto Causality Orient.	-.014	-.046	-.029	.302**	.196*	.251**	.282**	-.177

Table 4. (Continued)

	Extrinsic-External Motivation	Extrinsic-Introjected Motivation	Extrinsic-Identified Motivation	Intrinsic Motivation	Perceived Autonomy Support	Self-Regulation	Autonomous Causality Orientation
Written Score	-.131	-.037	-.057	-.077	-.003	.100	-.014
Skill Score	-.227*	-.035	-.134	-.116	-.106	-.071	-.046
Achievement	-.185*	-.039	-.096	-.102	-.049	.033	-.029
Perceived Comp.	.195*	-.007	.223*	.199*	.197*	.223*	.302**
BN Autonomy	.166	.098	.111	.192*	.316**	.291**	.196*
BN Competence	.121	-.140	.045	.131	.331**	.331**	.251**
BN Relatedness	.264**	.086	.233*	.252**	.448**	.431**	.282**
Amotivation	-.140	-.032	-.234*	-.299**	-.306**	-.288**	-.177

Table 4. (Continued)

	Extrinsic-External Motivation	Extrinsic-Introjected Motivation	Extrinsic-Identified Motivation	Intrinsic Motivation	Perceived Autonomy Support	Self-Regulation	Autonomous Causality Orientation
Extrinsic-External	-	.611**	.620**	.601**	.477**	.342**	.285**
Extrinsic-Introjected	.611**	-	.624**	.665*	.230*	.245**	.258**
Extrinsic-Identified	.620**	.624**	-	.746**	.448**	.349**	.342**
Intrinsic Motivation	.601**	.665**	.746**	-	.513**	.537**	.288**
Autonomy Support	.477**	.230*	.448**	.513**	-	.463**	.101
Self-Regulation	.342**	.245**	.349**	.537**	.463**	-	.238*
Auto. Causality Orient.	.285**	.258**	.342**	.288**	.101	.238*	-

** Correlation significant at the .01 level.
*Correlation significant at the .05 level.

Multiple Regression Analysis to Predict the Four Types of Motivation by Perceived Autonomy Support and Perceived Competence

A series of hierarchical multiple regression analysis were performed to evaluate the predictive relationships among perceived autonomy support, perceived competence, and the four types of motivation (Hypothesis 3). The results from this series of analysis are summarized in Table 5. The first hierarchical multiple regression analysis used perceived competence and perceived autonomy support as independent variables entered in separate blocks to predict extrinsic-external motivation. The overall model yielded a statistically significant R^2 (R^2 =.488, F=17.81, p=.000), accounting for 48.8% of the variance. Perceived competence was entered into the first block of the regression and yielded an R^2 of .038. Perceived autonomy support was entered into the second block and yielded a .200 R^2 change. As can be seen in Table 5, the analysis found autonomy support to have a significant Beta value. This analysis supports the hypothesis that perceived autonomy support will predict extrinsic-external motivation.

The next multiple regression analysis used the same independent variables as listed above to predict extrinsic-introjected motivation. This analysis yielded a statistically significant R^2 (R^2=.056, F=3.362, p.=.038), accounting for 5.6% of the variance. Perceived competence was entered into the first block of the regression and yielded an R^2 of .000. Perceived autonomy support was entered into the second block and yielded a .056 R^2 change. As can be seen in Table 5, the analysis yielded a significant Beta value for perceived autonomy support which partially supports the

hypothesis that perceived autonomy support will predict extrinsic-introjected motivation.

Another multiple regression analysis used the same independent variables as the previous two analyses to predict extrinsic-identified motivation. This analysis yielded a statistically significant R^2 (R^2=.220, F=16.04, p.=.000), accounting for 22% of the variance. Perceived competence was entered into the first block of the regression and yielded an R^2 of .050. Perceived autonomy support was entered into the second block and yielded a .170 R^2 change. As can be seen in Table 5 the analysis yielded a significant Beta value for perceived autonomy support which partially supports the hypothesis that perceived autonomy support will predict extrinsic-identified motivation.

A final multiple regression analysis was conducted to analyze this hypothesis and again used the same independent variables as the previous three analyses to predict intrinsic motivation. This analysis yielded a statistically significant R^2 (R^2=.273, F=21.399, p.=.000), accounting for 27% of the variance. Perceived competence was entered into the first block of the regression and yielded an R^2 of .040. Perceived autonomy support was entered into the second block and yielded a .233 R^2 change. This analysis yielded a significant Beta value for perceived autonomy support (see Table 5), which partially supports the hypothesis that perceived autonomy support will predict intrinsic motivation.

Table 5

Hypothesis 3: Beta Values for the Predictions for the Four Types of Motivation by Perceived Autonomy Support and Perceived Competence

	Extrinsic-Ext.	Extrinsic- Intro	Extrinsic-Ident.	Intrinsic
Perceived Autonomy Support	.456**	.241*	.420**	.493**
Perceived Competence	.105	-.054	.140	.102

* Significant at p.<.05 ** Significant at p.<.01

Table 6

Hypothesis 4: Beta Values for the Prediction of Achievement by Perceived Autonomy Support and Perceived Competence

Variable	Beta
Perceived Autonomy Support	-.092
Perceived Competence	.216*

* Significant at p.<.05 ** Significant at p.<.01

Multiple Regression Analysis to Predict Achievement by Perceived Autonomy Support and Perceived Competence

Hypothesis 4 (see table of hypotheses on page 33) was evaluated by conducting a hierarchical multiple regression analysis that use perceived competence and perceived autonomy support as the independent variables and achievement as the dependent variable. The results of this analysis are presented in Table 6. The overall model yielded a non-significant R^2 (R^2 =.047, F=2.816, p=.064), accounting for 4.7% of the variance. Perceived competence was entered into the first block of the regression and yielded an R^2 of .039. Perceived autonomy support was entered into the second block and yielded a .008 R^2 change. The analysis found perceived competence to have a significant Beta value. This analysis provides weak support for the hypothesis (Hypothesis 4) that perceived competence will predict achievement.

Multiple Regression Analysis to Predict the Four Types of Motivation by Autonomous Causality Orientation

Four separate multiple regression analyses were conducted to evaluate the hypothesis that autonomous causality orientation will predict the four types of motivation. The first regression analysis entered autonomous causality orientation as the independent variable and extrinsic-external motivation as the dependent variable. The overall model yielded a significant R^2 (R^2 =.096, F=12.282, p=.001), accounting for 9.6% of the variance. The analysis found autonomous causality orientation to have a significant Beta value (see Table 7). This analysis supports the hypothesis (Hypothesis 7) that autonomous causality orientation will predict extrinsic-external motivation.

The second regression analysis entered autonomous causality orientation as the independent variable and extrinsic-introjected motivation as the dependent variable. The overall model yielded a significant R^2 (R^2 =.073, F=9.045 p=.003), accounting for 7.3% of the variance. The analysis found autonomous causality orientation to have a significant Beta value (see table 7). This analysis supports the hypothesis (Hypothesis 7) that autonomous causality orientation will predict extrinsic-introjected motivation.

The next regression analysis entered autonomous causality orientation as the independent variable and extrinsic-identified motivation as the dependent variable. The overall model yielded a significant R^2 (R^2 =.043, F=5.159 p=.025), accounting for 4.3% of the variance. The analysis found autonomous causality orientation to have a significant beta value (beta= .207, p=.025). This analysis supports the hypothesis (Hypothesis 7) that autonomous causality orientation will predict extrinsic-identified motivation.

The final multiple regression analysis in this series of analyses entered autonomous causality orientation as the independent variable and intrinsic motivation as the dependent variable. The overall model yielded a non-significant R^2 (R^2 =.015, F=1.786 p=.182), accounting for only 1.5% of the variance. The analysis did not find autonomous causality orientation to have a significant Beta value (see table 7). This analysis does not support the hypothesis (Hypothesis 7) that autonomous causality orientation will predict intrinsic motivation.

Table 7

Hypothesis 7: Beta Values for the Prediction of the Four Types of Motivation by Autonomous Causality Orientation

	Extrinsic-Ext.	Extrinsic- Intro	Extrinsic-Ident.	Intrinsic
Autonomous Causality Orientation	.311**	.270**	.207*	.124

** Significant at p.<.05* *** Significant at p.<.01*

Multiple Regression Analysis to Predict Achievement by Autonomous Causality Orientation

Hypothesis 8 (see table of hypotheses on page 33) was evaluated by conducting a multiple regression analysis that used autonomous causality orientation as the independent variable and achievement as the dependent variable. The overall model yielded a non-significant R^2 (R^2 =.010, F=1.198, p=.276), accounting for only 1% of the variance. The analysis found autonomous causality orientation to have a non-significant Beta value (Beta= .102, p=.276). This analysis does not support the hypothesis (Hypothesis 8) that autonomous causality orientation will predict achievement.

Multiple Regression Analysis to Predict the Four Types of Motivation by Need of Competence, Need of Relatedness, and Need of Autonomy

A series of hierarchical multiple regression analysis were performed to evaluate the predictive relationships among the three basic need variables and the four types of motivation. The results from these analyses are presented in Table 8. The first hierarchical multiple regression analysis used need of competence, need of relatedness, and need of autonomy as independent variables entered in separate blocks to predict extrinsic–external motivation. The overall model yielded a significant R^2 (R^2 =.072, F=2.907, p=.038), accounting for 7.2% of the variance. The analysis found basic need of relatedness to have the only significant Beta value (see Table 8). This analysis partially supports the hypothesis (Hypothesis 11) that the three basic need variables will predict extrinsic-external motivation.

The next hierarchical multiple regression analysis used the same independent variables as in the previous analysis to predict extrinsic–introjected motivation. The overall model yielded a statistically significant R^2 (R^2 =.081, F=.3.309, p=.023), accounting for 8.1% of the variance. The analysis found basic need of competence to have the only significant Beta value (see Table 8). This analysis does not support the hypothesis (Hypothesis 11) that the three basic needs will predict extrinsic-introjected motivation.

The third hierarchical multiple regression analysis used to test hypothesis 11 (see table on page 34) used the same independent variables as in the previous two analyses to predict extrinsic–identified motivation. The overall model yielded a marginally significant R^2 (R^2 =.065, F=2.622, p=.054), accounting for 6.5% of the variance. The analysis found basic need of relatedness to have the only significant Beta value (see Table 8). This analysis partially supports the hypothesis (Hypothesis 11) that the three basic needs will predict extrinsic-identified motivation.

The next hierarchical multiple regression analysis used the same independent variables as in the previous three analyses to predict intrinsic motivation. The overall model yielded a statistically significant R^2 (R^2 =.067, F=2.722, p=.048), accounting for 6.7% of the variance. The analysis found none of the basic need variables to have significant Beta values. This analysis does not support the hypothesis (Hypothesis 11) that the three basic needs will predict intrinsic motivation.

Table 8

Hypothesis 11: Beta Values for the Prediction of the four Types of Motivation by Need of Autonomy, Need of Competence, and Need of Relatedness

	Extrinsic-Ext.	Extrinsic- Intro	Extrinsic-Ident.	Intrinsic
Basic Needs Autonomy	.033	.192	.004	.081
Basic Needs Competence	-.051	-.341**	-.128	-.043
Basic Needs Relatedness	.274*	.165	.302*	.228

* Significant at p.<.05 ** Significant at p.<.01

Multiple Regression Analysis to Predict the Four Types of Motivation by Need of Competence, Need of Relatedness, and Need of Autonomy

Hypothesis 12 (see table on page 34) was evaluated by conducting a multiple regression analysis that used the basic need of competence, basic need of relatedness, and basic need of autonomy as the independent variables and achievement as the dependent variable. The results from this analysis are presented in Table 9. The overall model yielded a non-significant R^2 (R^2 =.059, F=2.343, p=.077), accounting for only 5.9% of the variance. The analysis found basic need of autonomy to have a statistically significant, negative Beta value (see Table 9). This analysis does not support the hypothesis (Hypothesis 12) that the three basic need variables will predict achievement.

Multiple Regression Analysis to Predict Self-Regulation by the Four Types of Motivation

A hierarchical multiple regression analysis was performed to evaluate the predictive relationships among self-regulation and the four types of motivation. The hierarchical multiple regression analysis used extrinsic-external motivation, extrinsic-introjected motivation, extrinsic-identified motivation, and intrinsic motivation as the independent variables entered in separate blocks to predict self-regulation. The results from this analysis are presented in Table 10. The overall model yielded a statistically significant R^2 (R^2 =.321, F=.12.138, p=<.0001), accounting for 32% of the variance. Extrinsic-external motivation was entered into the first block of the regression and yielded an R^2 of .117. Extrinsic-introjected motivation was entered into the second block and yielded a .002 R^2 change. Extrinsic-identified motivation

was entered into the third block and yielded a marginally significant .029 R^2 change. Finally, intrinsic motivation was entered into the fourth block and yielded a significant .173 R^2 change. The analysis found intrinsic motivation to have a strong significant Beta value. The analysis also found extrinsic-introjected motivation to have a marginally significant negative Beta value (beta=-.221, p.=.052). This analysis partially supports the hypothesis (Hypothesis 13) that the four motivation variables will predict self-regulation.

Multiple Regression Analysis to Predict Achievement by the Four Types of Motivation and Self-Regulation

A hierarchical multiple regression analysis was performed to evaluate the predictive relationships among achievement, self-regulation and the four types of motivation. The hierarchical multiple regression analysis used extrinsic-external motivation, extrinsic-introjected motivation, extrinsic-identified motivation, and intrinsic motivation and self-regulation as the independent variables entered in separate blocks to predict achievement. The results from analysis are presented in Table 11. The overall model yielded a non-significant R^2 (R^2 =.061, F=1.424, p=.221), accounting for only 6.1% of the variance. Self-regulation was entered into the first block and yielded an R^2 of .001. Extrinsic-external motivation was entered into the second block of the regression and yielded a significant .043 R^2 change. Extrinsic-introjected motivation was entered into the third block and yielded a .008 R^2 change. Extrinsic-identified motivation was entered into the fourth block and yielded a .001 R^2 change. Finally, intrinsic motivation was entered into the fifth block and yielded a .008 R^2 change. The analysis found extrinsic-external motivation

to have a significant negative Beta value. This analysis does not support the hypothesis (Hypothesis 14) that the four types of motivation and self-regulation will predict achievement.

Table 9

Hypothesis 12: Beta Values for the Prediction of Achievement by Need of Autonomy, Need of Relatedness, Need of Competence

	Beta
Need of Autonomy	-.285*
Need of Competence	.090
Need of Relatedness	.008

* Significant at p.<.05 ** Significant at p.<.01

Table 10

Hypothesis 13: Beta Values for the Prediction of Self-Regulation by the Four Types of Motivation

	Beta
Extrinsic-External Motivation	.136
Extrinsic-Introjected Motivation	-.221
Extrinsic-Identified Motivation	-.107
Intrinsic Motivation	.682**

* Significant at p.<.05 ** Significant at p.<.01

Table 11

Hypothesis 14: Beta Values for the Prediction of Achievement by Self-Regulation and the Four Types of Motivation

	Beta
Self-Regulation	.159
Extrinsic-External Motivation	-.261*
Extrinsic-Introjected Motivation	.176
Extrinsic-Identified Motivation	.023
Intrinsic Motivation	-.162

* Significant at p.<.05 ** Significant at p.<.01

CHAPTER V

Discussion

The purpose of this study was to investigate the relationships among self-determination variables and learning outcomes in an adult training environment. This chapter will begin with a summary of the support found or not found for each hypothesis. I will continue by discussing the findings of relationships among variables, the implications of these relationships, and their impact on learning outcomes. Finally, limitations and future research will be addressed.

Correlation and multiple regression analyses were used to evaluate the hypotheses. Partial support was found for eight of the fourteen hypotheses. One was fully supported, and five were not supported. There were several unanticipated findings. First, I was surprised to find that extrinsic-external motivation was positively related to perceived competence, autonomy support and self-regulation. I was also surprised to find a negative relationship between basic need of autonomy and achievement. Also unanticipated was that perceived competence was the only variable that related positively with achievement and that intrinsic motivation was not found to be a predictor of achievement. Although the findings at least partially supported a number of hypotheses presented in this study, the contrary findings raise several intriguing questions that are of great interest to the field of learning and training motivation. The findings and questions will be discussed more fully following the summary of the findings by hypothesis. The list of hypotheses can be found in Table 1 (p. 33).

Summary of Findings by Hypothesis

Hypotheses 1 through 4 were used to evaluate cognitive evaluation theory in a training context. Hypothesis 1, regarding expected positive correlations, was partially supported by the data, in that perceived competence to be positively related to extrinsic-identified motivation, intrinsic motivation, and achievement, but not related to extrinsic-introjected. Perceived autonomy support positively related to extrinsic-introjected motivation, extrinsic-identified motivation, intrinsic motivation, but not achievement.

Hypothesis 2, regarding expected negative correlations, was not supported by the data. Neither perceived competence nor perceived autonomy support were found to be negatively related to extrinsic-external motivation. Hypothesis 3 was partially supported by the data. Perceived autonomy support differentially predicted all 4 levels of motivation. Perceived competence, however, was not found to be a predictor of any motivation variables. Hypothesis 4 was partially supported. Perceived competence was found to be a predictor of achievement, while perceived autonomy support was not.

Hypotheses 5 through 8 were used to evaluate causality orientation theory in a training context. Hypothesis 5 was partially supported by the data finding autonomous causality orientation to be positively related to extrinsic-introjected motivation, extrinsic-identified motivation, intrinsic motivation. No relationship with achievement was found. Hypothesis 6 was not supported by the data since a negative relationship was not found between autonomous causality orientation and extrinsic-external motivation. Rather, a positive relationship was discovered between the two

variables. Hypothesis 7 was partially supported by the data as autonomous causality orientation was found to differentially predict all four types of motivation. Hypothesis 8 was not supported by the data because autonomous causality orientation was not found to be a predictor of achievement.

Hypotheses 9 through 12 were used to evaluate basic needs theory in a training context. Hypothesis 9 was marginally supported by the data as basic need of autonomy was positively related only to intrinsic motivation and basic need of relatedness was related to extrinsic-identified motivation and intrinsic motivation. None of the basic needs variables was found to be related to achievement, and the basic need of competence was unrelated to all the variables predicted in hypothesis 9. Hypothesis 10 was not supported by the data. The basic need of autonomy, basic need of competence, and basic need of relatedness were not found to be negatively related to external-extrinsic motivation. Instead, basic need of relatedness was found to have a positive relationship with external-extrinsic motivation, while the basic need of competence and basic need of autonomy had no relationship with extrinsic-external motivation.

Hypothesis 11 was marginally supported by the data as basic need of competence was found to differentially predict extrinsic-introjected motivation, but it was not found to predict extrinsic-external, extrinsic identified, or intrinsic motivation. Additionally, basic need of relatedness was found to be a predictor of extrinsic-external motivation and extrinsic-identified motivation. Basic need of autonomy was not found to be a predictor of any of the four motivation variables. Hypothesis 12 was marginally supported by the data as basic need of autonomy was

found to be a predictor of achievement. However, basic need of competence and basic need of relatedness were not found to be predictors of achievement.

Hypotheses 13 and 14 were used to evaluate organismic integration theory in a training context. Hypothesis 13 was partially supported by the data in that Intrinsic motivation was found to be the most powerful predictor of self-regulation, while extrinsic-introjected was found only to be marginally predictive of self-regulation. Extrinsic-external motivation and extrinsic-identified motivation were not found to be predictors of motivation. Finally, hypothesis 14 was not supported by the data as the regression analysis for this hypothesis yielded a non-significant model. However, extrinsic-external motivation was found to be a negative predictor of achievement.

Perceived Competence Related to Cognitive Evaluation Theory

The first finding to be highlighted is that perceived competence was strongly related to achievement. Additionally, a multiple regression analysis revealed that perceived competence is a significant predictor of achievement. The data revealed that trainees who perceive themselves as having the ability to be successful in the training program achieved higher than those student who reported lower perceived competence levels. This finding is consistent with prior research that has found that students who feel competent to complete a task successfully, actually perform at higher levels than student who have lower competence levels (Miller et al., 1993; Levine, et al., 1983; Deci, et al., 1989). Thus, cognitive evaluation theory (Ryan & Deci, 1980) is supported and Hypothesis 4 is partially supported. This finding highlights the importance of helping the learner develop a sense of competence in the learning environment. Additionally, designing curricula that nurtures competence in

the early stages may also reduce trainee attrition, as well as increase achievement scores.

The strong relationship between perceived competence and intrinsic motivation again points out that students who feel more competent will be more likely to learn for intrinsic reasons. Additionally, the strong relationship between perceived competence and self-regulation gives further support to cognitive evaluation theory and the belief that competence level is strongly related to student self-regulated behavior such as planning and monitoring learning. Although perceived competence was found to have a strong relationship with intrinsic motivation and self-regulation, statistical analysis did not reveal any predictive relationship between these variables when predicting self-regulation. The above findings, again, suggests that designing curriculum that builds confidence in one's ability to succeed may increase intrinsic motivation and encourage greater achievement.

Perceived Autonomy Support Related to Cognitive Evaluation Theory

Perceived autonomy support was found to be a predictor of all four motivation variables (extrinsic-external, extrinsic-introjected, extrinsic-identified, and intrinsic) which partially supports Hypothesis 3 and the research of Zuckerman et al. (1978). However, this finding was inconsistent with cognitive evaluation theory's notion that the more autonomous the environment, the more likely a student will be affiliated with intrinsic motivation (Ryan & Deci, 2000b). The finding that perceived autonomy support was related to extrinsic-external motivation may be pointing out that perceived autonomy support encourages extrinsic-external motivation, as well as

intrinsic motivation depending upon the student. For example, it may be that a student who is less self-regulated and perceives his environment as more autonomy supportive may take advantage of his environment and become more affiliated with extrinsic-external motivation rather than more positive levels of extrinsic motivation or intrinsic motivation. Individual differences may be the determining factor of a person's motivation in such an environment. This intriguing finding needs further investigation.

The positive relationship between perceived autonomy support and perceived competence was another important finding to highlight. Both of these variables are important to overall achievement because perceived competence was found to be a predictor of achievement. This suggests that trainees who perceive a more autonomous supportive environment may tend to have higher levels of perceived competence and possibly have a better chance to perform well in the course. The strong relationship between perceived autonomy support and self-regulation also suggests that providing a classroom atmosphere that fosters freedom and support will result in students exhibiting more confidence in their competence, self-regulated behavior, and thus higher levels of achievement. Although perceived autonomy support did not predict achievement, the relationships mentioned previously demonstrate the impact such an environment has on competence, self-regulation, and motivation.

Autonomous Causality Orientation Related to Causality Orientation Theory

The finding that autonomous causality orientation was strongly related to perceived competence and self-regulation supports the assumptions of causality

orientation theory (Ryan & Deci, 2000b). Although this variable is measuring a person's causality affiliation, it points out the detrimental effects that a lower level of autonomous causality orientation can have on a person's feelings of competence and self-regulated behaviors. For example, a person who feels that he has no control over his training environment and that his efforts will not result in a good score is likely to feel less competent and may not exhibit as much self-regulated behavior as a student who enters the course with the belief that he controls his own destiny.

Autonomous causality orientation's positive relationships with all motivation variables (extrinsic-external, extrinsic-introjected, extrinsic-identified, and intrinsic) points out the positive influence an autonomous causality orientation has on a learner's motivation. However, this again raises an important question. Why is this variable strongly related to all levels of motivation?

It should be noted that autonomous causality orientation was not significantly related to achievement. Nor was autonomous causality orientation negatively related to extrinsic-external motivation as predicted. However, the strong relationships with self-regulation and perceived competence support the importance of autonomous causality orientation and its relationship to learning outcomes. Although, autonomous causality orientation is not easily influenced in a training environment, trainers may be able to use a measure of this variable to screen for potential trainees who have higher levels of autonomous causality orientation and may have a chance to be more successful in the training program.

Basic Psychological Needs

The finding that the basic need of autonomy was positively related to self-regulation, perceived autonomy support, and intrinsic motivation supports Ryan and Deci's (2000b) basic needs theory. Thus, a student who has feelings of overall autonomy in life may tend to exhibit more self-regulated behaviors, perceive his environment as more supportive, and tend toward intrinsic motivation. This supports the research of Zuckerman et al. (1978) who found that students who were exposed to an autonomous environment while completing a task were more likely to be intrinsically motivated than participants who were exposed to a more restrictive environment.

An interesting finding was the negative predictive relationship between basic need of autonomy and achievement. Trainees who had lower feelings of general autonomy scored better on course examinations than students with higher feelings of general autonomy. This finding suggests that students who do not feel a high sense of global autonomy are thriving in the autonomy supportive environment. This could be the result of the trainees increased sense of free choice and self-determination rather than the feelings of obligation that usually accompany normal life activities. In this case the new autonomous environment is so different from the learner's regular environment that the change results in an increase in the trainee's desire and effort to learn.

Basic need of competence was found to be related to perceived competence, perceived autonomy support, and self-regulation, which again supports basic needs theory (Ryan & Deci, 2000b), which is a component of self-determination theory.

The data also showed that students with higher levels of global competence had lower levels of extrinsic-introjected motivation. This finding suggests that students who feel more globally competent are less motivated by external rewards and punishments and tend toward more self-determined behavior. This finding also highlights the importance of a learner's feelings if general competence.

Basic need of relatedness was found to be related to three of the four types of motivation including extrinsic-external, extrinsic-identified, and intrinsic, which partially supports basic needs theory (Ryan & Deci, 2000b). The positive relationships found between basic need of relatedness and extrinsic-external motivation, extrinsic-identified motivation, and intrinsic motivation again suggests that relationships between relatedness and motivation may be influenced by individual differences. For example, a learner who is high in the relatedness need may overindulge in the social experience the training context has provided and may tend toward extrinsic-external motivation. On the other hand, a trainee who is high on the relatedness need may also be psychologically supported by the satisfaction of this need and be more intrinsically motivated to learn. The way a person behaves in a relatedness valuing training environment, whether responsibly, irresponsibly, intrinsically, or extrinsically may be influenced by individual differences. This finding needs further investigation.

The positive relationship found between the need of relatedness and autonomous causality orientation indicates that a student who has sufficiently meet relatedness needs may be more likely to have an high autonomous causality orientation. Additionally, the need of relatedness was found to be related to self-

regulation and perceived competence. Thus, the relationship relatedness has with motivation suggests that the need for relatedness is an important factor effecting learning outcomes in the training context studied here. This finding, however, may be different for younger learners.

Self-Regulation Related to Organismic Integration Theory

Self-regulation's strong relationship with perceived competence, and autonomy support demonstrates the interdependent relationships among these variables. This outcome supports organismic integration theory (Ryan & Deci, 2000b) and the research of Greene and Miller (1996), Miller at al. (1993), Levine et al. (1983); Deci et al. (1989), and Pintrich and DeGroot (1990), which has demonstrated that learners who have higher levels of perceived competence and autonomy support exhibit more self-regulated behavior. This finding also illustrates the interdependent relationship between the variables and highlights their importance in the learning context. It can be concluded from the findings of this study that training environments that encourage self-regulated behaviors tend to foster greater feelings of competence and autonomy support.

The data also revealed that students who reported being intrinsically motivated also reported higher levels of self-regulated behaviors. Thus, trainees who cared more about learning for their own satisfaction were likely to be the students who reported higher self-regulated behaviors. This finding suggests that training curricula that incorporates an atmosphere that is based on intrinsic motivation rather than extrinsic motivation may foster higher levels of student self-regulated behaviors. Additionally, training curricula that encourages self-regulation may tend to foster

feelings of competence and autonomy support. Future research is needed to test these proposed causal relationships.

Motivation and Achievement

Extrinsic-external motivation was found to be a negative predictor of achievement and was the only significant relationship found between the achievement and motivation variables. In this case, the more extrinsic-externally motivated the learner was, the lower was his or her achievement. This finding suggests the potential detrimental effect of extrinsic-external motivation.

Summary

In sum, this investigation has demonstrated SDT as a useful framework to understand motivation in a training context. Each of the four subtheories of SDT was found to be useful for the explanation of training motivation. A number of assertions of the subtheories were supported, while several were not supported.

This study demonstrates cognitive evaluation theory to be a viable framework to understand the influence of perceived competence and autonomy on a person's motivation in a training environment. It was found that students with higher levels of perceived competence to learn the course material also achieved at higher levels. The relationships perceived competence and perceived autonomy support had with intrinsic motivation also gave strong support. The positive relationship perceived competence and perceived autonomy support had with all motivation levels suggests that other factors may contribute to a person's motivational affiliation.

Autonomous causality orientation theory was also demonstrated to be an effective means to understand training motivation. This investigation found that

trainees who feel a since of control over their learning outcome feel more confident in their ability to learn the material. They also exhibited more self-regulated behavior. The positive relationship found between autonomous causality orientation and all motivation levels again suggests that other factors may contribute to a person's motivational affiliation.

This study suggests that basic psychological needs theory can be used to understand motivation in a training context. The negative predictive relationship found between the need of autonomy and achievement highlights the influence autonomy has on achievement. Providing students with a sense of autonomy can be a useful strategy to increase the performance of students who have low global autonomy satisfaction. Finally, organismic integration theory was also found to be useful to explain training motivation. This study supported the assertion that learners who have higher levels of perceived autonomy support would have higher levels of motivation and tend to have more positive levels of self-regulation.

Limitations

Several limitations exist and must be addressed as one applies the findings of this study. First, the lack of females in the sample will only allow generalizations to male trainees. The small number of females in the sample was due in part by the demographics of this particular training program.

Another limitation in this study was the presence of extraneous individual difference variables that may influence the relationships among the variables being measured. It is difficult to know the impact variables such as energy, mood, or personality may have on motivation and achievement. As noted earlier in this

chapter, several questions have been raised regarding the influence of these individual difference variables and how they might effect motivation and achievement.

A third limitation is the training environment that was used for this study. This study specifically investigated training motivation and outcomes of moderately educated employees placed in a technical training program. It will be important to have a number of additional studies to investigate trainees of different professional levels who are being trained in differing types of environments.

A fourth limitation is the measure of extrinsic motivation. Although the Academic Motivation Scale was used to measure different types of motivation, it does not take into account that extrinsic motivation may be viewed differently by the employees in this setting. Thus, the notion of extrinsic motivation may be different in an adult training environment. For example, an employee who is given a raise or recognition for good performance may not feel a loss of autonomy and may excel even though he may report high levels of extrinsic-introjected motivation. It is also important to note that a person can have a high extrinsic-external motivation score and a high extrinsic-identified motivation score at the same time. Therefore, a trainee may affiliate with two or three motivations at once.

Finally, the sample size for this study might have been too low to provide the power needed to adequately test all hypotheses. A larger sample might have strengthened the relationships between the variables.

Implications for Future Research and Practice

This study should stimulate additional research in the areas of training motivation, antecedents of motivation, and trainee individual differences. Additionally, future

investigations are needed to better understand how the principles of self-determination theory can be used to understand motivation in educational and training settings. Several questions have been identified in this study that needs further investigation. For instance, can an autonomy supportive training environment both hinder and support a person's intrinsic motivation orientation depending upon individual differences such as personality, education level, or training experience? Also, is there any support for the finding that the need of autonomy is a negative predictor of achievement? Are the findings of this study consistent across males and females? Finally, are the findings of this study consistent with training outcomes with executive level trainees or within a non-technical training context?

This study has investigated motivation and learning outcomes in a training context to better understand how trainers and instructional designers can develop training courses that will produce better learners and more productive employees. Although need for future research is clear, this study still has several important implications for practice.

First, because higher levels of perceived competence lead to higher levels of intrinsic motivation, self-regulated behavior, and achievement, trainers should seek to provide a climate that will increase student perceived competence. This can be accomplished in a number of ways. In particular, trainers can develop instruction that promotes small victories closer to the beginning of the course and that provides positive feedback and encouragement even when a trainee has experienced failure or low achievement.

Second, trainers should also provide an autonomy supportive learning environment for trainees to support more intrinsic motivation in students. This can be accomplished by creating an open and caring trainer-trainee relationship that uses immediate feedback, correction, and encouragement. This relationship should also encourage students to seek help or to ask questions. An autonomy supportive environment can also be developed by providing students with choice and self-guided learning activities that give the student the feeling that he or she is in control of the learning situation. Trainers can also increase the supportive environment by communicating the guidelines and expectations of the course in a clear and precise manner.

Third, this study points out that general feelings of competence will help each trainee feel more confident about his or her ability to be successful with the learning tasks that are confronted. Providing experiences that build confidence and self-reliance outside of the classroom can be a great way to increase a person's global competence level. Such activities might include a ropes course, games, and physical or artistic activities.

Fourth, training curricula should encourage students to learn and to use self-regulation techniques including goal-setting, study strategy use, and self-monitoring. Incorporating these self-regulation activities can lead to intrinsic motivation, higher levels of autonomous causality orientation, and greater feelings of competence.

Finally, because intrinsic motivation leads to self-regulated behavior, instructors can increase learning outcomes by developing curricula that increases a student's intrinsic motivation. One way that this can be accomplished is by integrating learning

activities that stimulate curiosity and provide challenge. Additionally, creating a learning environment that stresses personal satisfaction rather than competitiveness or external rewards is more likely to encourage intrinsic motivation.

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APPENDIX A

Appendix A

Demographic Information

1. What is your gender?
   __Female
   __ Male

2. What is your age?
   __ 18-24
   __ 25- 29
   __ 30-39
   __ 40-49
   __ 50+

3. In which region of the country is your post office located ?
   __ Northeast
   __ East
   __ Southeast
   __ South Central
   __ North Central
   __ Midwest
   __Southwest
   __West
   __Northwest

4. What is your Race?
   __ Black
   __ White
   __ Asian
   __ Native American
   __ Hispanic
   __ Other _____.

5. How long have you been employed by the United States Postal Service?
   __ 1 year or less
   __ 2-5 years
   __ 6-10 years
   __ 11-15 years
   __ 16-20 years
   __ 21-25 years
   __ 26+ years

6. How many times have you trained at this training facility?
   - __ 1 (this is the first time)
   - __ 2-5
   - __ 6-10
   - __ 10-15
   - __ 16 or more

7. What is the highest level of education that you have completed?
   - __ Grade School
   - __ GED
   - __ High School
   - __ Associates Degree or two years of college
   - __ College Degree
   - __ Graduate Degree (Masters or Ph.D.)

8. What is the reason for your training?
   - __ Promotion
   - __ Updating skills
   - __ New job training

APPENDIX B

Appendix B

Learning Climate Questionnaire (LCQ)

This questionnaire contains items that are related to your experience with your instructor in this class. Instructors have different styles in dealing with students, and we would like to know more about how you have felt about your encounters with your instructor. Your responses are confidential. Please be honest and candid.

Please use the following scale:

1 2 3 4 5 6 7
strongly disagree neutral strongly agree

	Strongly disagree						Strongly agree
1. I feel that my instructor provides me choices and options.	1	2	3	4	5	6	7
2. I feel understood by my instructor.	1	2	3	4	5	6	7
3. I am able to be open with my instructor during class.	1	2	3	4	5	6	7
4. My instructor conveys confidence in my ability to do well in the course.	1	2	3	4	5	6	7
5. I feel my instructor accepts me.	1	2	3	4	5	6	7
6. My instructor made sure I really understood the goals of the course and what I need to do.	1	2	3	4	5	6	7
7. My instructor encourages me to ask questions.	1	2	3	4	5	6	7
8. I feel a lot of trust in my instructor.	1	2	3	4	5	6	7
9. My instructor answers my questions fully and carefully.	1	2	3	4	5	6	7
10. My instructor listens to how I would like to do things.	1	2	3	4	5	6	7
11. My instructor handles people's emotions well.	1	2	3	4	5	6	7
12. I feel my instructor cares for me as a person.	1	2	3	4	5	6	7
13. I don't feel very good about the way my instructor talks to me.	1	2	3	4	5	6	7
14. My instructor tries to understand how I see things before suggesting a new way to do things.	1	2	3	4	5	6	7
15. I feel able to share my feelings with my instructor.	1	2	3	4	5	6	7

APPENDIX C

Appendix C

Perceived Competence for Learning

Please respond to each of the following items in terms of how true it is for you with respect to your learning in this course. Use the scale:

1	2	3	4	5	6	7
Not at all true			**Somewhat true**			**Very True**

1. I feel confident in my ability to learn this material.	1 2 3 4 5 6 7
2. I am capable of learning the material in this course.	1 2 3 4 5 6 7
3. I am able to achieve my goals in this course.	1 2 3 4 5 6 7
4. I feel able to meet the challenge of performing well in this course.	1 2 3 4 5 6 7

APPENDIX D

Appendix D

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Why do you participate in Training?

Using the scale below, indicate to what extent each of the following items presently correspond to one of the reasons why you participate in training.

Does not correspond at all	Corresponds a little	Corresponds moderately	Corresponds a lot	Corresponds exactly
1	2 3	4	5	6 7

1. Because without training I would not have a high paying job. 1 2 3 4 5 6 7
2. Because I experience pleasure and satisfaction while learning new things. 1 2 3 4 5 6 7
3. Because I think that training will help me better prepare for the career I have chosen. 1 2 3 4 5 6 7
4. For the intense feeling I experience when I am communicating my own ideas to others. 1 2 3 4 5 6 7
5. Honestly, I don't know, I really feel I am wasting my time in training. 1 2 3 4 5 6 7
6. For the pleasure I experience while surpassing myself in my studies. 1 2 3 4 5 6 7
7. To prove to myself that I am capable of completing training. 1 2 3 4 5 6 7
8. In order to obtain a more prestigious job later on. 1 2 3 4 5 6 7
9. For the pleasure I experience when I discover new things never seen before. 1 2 3 4 5 6 7

Why do you participate in Training?

Using the scale below, indicate to what extent each of the following items presently correspond to one of the reasons why you participate in training.

Does not correspond at all	Corresponds a little	Corresponds moderately	Corresponds a lot	Corresponds exactly
1	2 3	4	5	6 7

10. Because it will enable me to enter the job market I like.	1	2	3	4	5	6	7
11. For the pleasure that I experience when I read new things.	1	2	3	4	5	6	7
12. I once had good reasons for participating in training, however, now I wonder whether I should continue.	1	2	3	4	5	6	7
13. For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments.	1	2	3	4	5	6	7
14. Because of the fact that when I succeed in training I feel important.	1	2	3	4	5	6	7
15. Because I want to have "the good life" later on.	1	2	3	4	5	6	7
16. For the pleasure that I experience in broadening my knowledge on this subject.	1	2	3	4	5	6	7
17. Because this will help me make a better choice regarding career orientation.	1	2	3	4	5	6	7
18. For the pleasure that I feel when I feel completely absorbed by what I am learning.	1	2	3	4	5	6	7
19. I can't see why I participate in training and frankly, I could care less.	1	2	3	4	5	6	7

Does not correspond at all		Corresponds a little		Corresponds moderately		Corresponds a lot		Corresponds exactly
1	2	3	4	5		6		7

20. For the satisfaction I feel when I am in the process of accomplishing difficult academic activities.	1	2	3	4	5	6	7
21. To show myself that I am an intelligent person.	1	2	3	4	5	6	7
22. In order to have a better salary.	1	2	3	4	5	6	7
23. Because training allows me to learn things I am interested in.	1	2	3	4	5	6	7
24. Because I believe that time in training will improve my competence as a worker.	1	2	3	4	5	6	7
25. For the "high" feeling that I experience while reading about various interesting subjects.	1	2	3	4	5	6	7
26. I don't know; I can't understand why I am in training.	1	2	3	4	5	6	7
27. Because training allows me to experience a personal satisfaction in my quest for excellence.	1	2	3	4	5	6	7
28. Because I want to show myself that I can succeed.	1	2	3	4	5	6	7

APPENDIX E

Appendix E

Self-Regulation Questionnaire

The following asks about some of your specific behaviors as you study and learn. Respond to the statements along the following 5-point scale. Circle your response on the line following the item.

Strongly Disagree = 1 Disagree = 2 Undecided = 3 Agree = 4 Strongly Agree = 5

1. Before a quiz or exam, I plan out how I will study the material.	1 2 3 4 5
2. When I finish working a problem I check my answer to see if it is reasonable.	1 2 3 4 5
3. When I finished working I check my work for errors.	1 2 3 4 5
4. I organize my study time well for class.	1 2 3 4 5
5. It is easy for me to establish goals for learning in class.	1 2 3 4 5
6. I am usually aware of how I am performing on an activity.	1 2 3 4 5
7. I have a clear idea of what I am trying to accomplish in this class	1 2 3 4 5
8. I try to organize an approach in my mind before I actually start to execute a task.	1 2 3 4 5
9. When I study I take notes of the material I have or have not mastered.	1 2 3 4 5
10. I try to keep track of how well I am learning while I am studying.	1 2 3 4 5
11. I set goals for what I want to learn and accomplish.	1 2 3 4 5
12. I know the subjects I really enjoy learning.	1 2 3 4 5
13. I plan how I can accomplish my goals.	1 2 3 4 5
14. I think out how I will approach a problem before taking action.	1 2 3 4 5
15. I usually act before I think	1 2 3 4 5

16. I reward myself when I reach a goal. 1 2 3 4 5

17. While studying, I stop to ask myself whether or not I am understanding the material. 1 2 3 4 5

APPENDIX F

Appendix F

Basic Needs Scale

Instructions: Please read each of the following items carefully, think about how it relates to your life, and then indicate how true it is for you by circling the appropriate number. Use the following scale:

1 2 3 4 5 6 7
not at all true somewhat true very true

1.	I feel like I am free to decide for myself how to live my life.	1 2 3 4 5 6 7
2.	I really like the people I interact with.	1 2 3 4 5 6 7
3.	Often, I do not feel very competent.	1 2 3 4 5 6 7
4.	I feel pressured in my life.	1 2 3 4 5 6 7
5.	People I know tell me I am good at what I do.	1 2 3 4 5 6 7
6.	I get along with people I come into contact with.	1 2 3 4 5 6 7
7.	I pretty much keep to myself and don't have a lot of social contacts.	1 2 3 4 5 6 7
8.	I generally feel free to express my ideas and opinions.	1 2 3 4 5 6 7
9.	I consider the people I regularly interact with to be my friends.	1 2 3 4 5 6 7
10.	I have been able to learn interesting new skills recently.	1 2 3 4 5 6 7
11.	In my daily life, I frequently have to do what I am told.	1 2 3 4 5 6 7
12.	People in my life care about me.	1 2 3 4 5 6 7
13.	Most days I feel a sense of accomplishment from. what I do	1 2 3 4 5 6 7
14.	People I interact with on a daily basis tend to take my feelings into consideration.	1 2 3 4 5 6 7
15.	In my life I do not get much of a chance to show how capable I am.	1 2 3 4 5 6 7
16.	There are not many people that I am close to.	1 2 3 4 5 6 7

17. I feel like I can pretty much be by myself in my daily situations.	1	2	3	4	5	6	7
18. The people I interact with regularly do not seem to like me much.	1	2	3	4	5	6	7
19. I often do not feel very capable.	1	2	3	4	5	6	7
20. There is not much opportunity for me to decide for myself how to do things in my daily life.	1	2	3	4	5	6	7
21. People are generally pretty friendly towards me.	1	2	3	4	5	6	7

APPENDIX G

Appendix G

General Causality Orientations Scale (GCOS)

These items pertain to a series of hypothetical sketches. Each sketch describes an incident and lists three ways of responding to it. Please read each sketch, imagine yourself in that situation, and then consider each of the possible responses. Think of each response option in terms of how likely it is that you would respond that way. For example, if it is very unlikely you would respond the way describes in a given response, you should circle answer 1 or 2. If it is moderately likely, you would select a number in the mid range, and so on.

1 2 3 4 5 6 7

very unlikely moderately likely very likely

1. **You have been offered a new position in a company where you have worked for some time. How likely is it that each of the following thoughts will come to mind?**

   a.) What if I can't live up to the new responsibility? very unlikely 1 2 3 4 5 6 7 very likely

   b.) Will I make more at this position? 1 2 3 4 5 6 7

   c.) I wonder if the new work will be interesting? 1 2 3 4 5 6 7

2. **You have a school-age daughter. On parents' night the teacher tells you that your daughter is doing poorly and doesn't seem involved in the work. How likely is it that you will react in each of the following ways?**

   a.) Talk it over with your daughter to understand further what the problem is. ery unlikely 1 2 3 4 5 6 7 very likely

   b.) Scold her and hope she does better. 1 2 3 4 5 6 7

   c.) Make sure she does the assignment, because she should be working harder. 1 2 3 4 5 6 7

3. **You had a job interview several weeks ago. In the mail you received a form letter which states that the position has been filled. How likely is it that each of the following thoughts will come to mind?**

	very unlikely						very likely
a.) It's not what you know, but who you know.	1	2	3	4	5	6	7
b.) I'm probably not good enough for the job.	1	2	3	4	5	6	7
c.) Somehow they didn't see my qualifications as matching their needs.	1	2	3	4	5	6	7

4. **You are a plant supervisor and have been charged with the task of allotting coffee breaks to three workers who cannot all break at once. How likely is it that you will handle the situation in each of the following ways?**

	very unlikely						very likely
a.) Telling the three workers the situation and having them work with you on the schedule.	1	2	3	4	5	6	7
b.) Simply assigning times that each can break to avoid any problems.	1	2	3	4	5	6	7
c.) Find out from someone in authority what to do or do what was done in the past.	1	2	3	4	5	6	7

5. **A close (same-sex) friend of yours has been moody lately, and a couple of times has become very angry with you over "nothing". How likely is it that you will handle the situation in each of the following ways?**

	very unlikely						very likely
a.) Share your feelings with him/her and try to find out what is going on for him/her.	1	2	3	4	5	6	7
b.) Ignore it because there's not much you can do about it anyway.	1	2	3	4	5	6	7
b.) Tell him/her that you're willing to spend time together if and only if he/she makes effort to control him/herself.	1	2	3	4	5	6	7

6. **You have just received the results of a test you took, and you discovered that you did very poorly. How likely is it that each of the following thoughts will come to mind?**

	very unlikely						very likely
a.) "I can't do anything right," and feel sad.	1	2	3	4	5	6	7
b.) "I wonder how it is I did so poorly," and feel disappointed.	1	2	3	4	5	6	7
c.) "The stupid test doesn't show anything," and feel angry.	1	2	3	4	5	6	7

7. **You have been invited to a large party where you know very few people. How likely is each of the following expectations?**

	very unlikely						very likely
a.) You'll try to fit in whatever is happening in order to have a good time and not look bad.	1	2	3	4	5	6	7
b.) You'll find some people with whom you can relate.	1	2	3	4	5	6	7
c.) You'll probably feel somewhat isolated and unnoticed.	1	2	3	4	5	6	7

8. **You are asked to plan a picnic for yourself and your fellow employees. How likely is it that you will handle the situation in each of the following ways?**

	very unlikely						very likely
a.) Take charge: that is, you would make most of the major decisions yourself.	1	2	3	4	5	6	7
b.) Follow precedent: You're not really up to the task so you'd do it the way it's been done before.	1	2	3	4	5	6	7
c.) Seek participating: get inputs from others who want to make them before you make the final plans.	1	2	3	4	5	6	7

9. **Recently a position opened up at your place of work that could have meant a promotion for you. However, a person you work with was offered the job rather than you. How likely is it that each of the following thoughts will come to mind?**

	very unlikely						very likely
a.) You didn't really expect the job; you frequently get passed over.	1	2	3	4	5	6	7
b.) The other person probably "did the right things politically to get the job.	1	2	3	4	5	6	7
c.) You probably take a look at the factors in your own performance that led you to be passed over.	1	2	3	4	5	6	7

10. **You are embarking on a new career. How likely is it that each of the following thoughts will come to mind?**

	very unlikely						very likely
a.) Whether you can do the work without getting in over.your head	1	2	3	4	5	6	7
b.) How interested you are in that kind of work.	1	2	3	4	5	6	7
c.) Whether there are good possibilities for advancement.	1	2	3	4	5	6	7

11. **A woman who works for you has generally done an adequate job. However, for the past two weeks her work has not been up to par and she appears to be less actively interested in her work. How likely is it that you will handle the situation in each of the following ways?**

	very unlikely						very likely
a.) Tell her that her work is below what is expected and that she should start working harder.	1	2	3	4	5	6	7
b.) Ask her about the problem and let her know you are available to help work it out.	1	2	3	4	5	6	7
c.) It's hard to know what to do to get her straightened out.	1	2	3	4	5	6	7

12. **Your company has promoted you to a position in a city far from your present location. How likely is it that you will react in each of the following ways?**

	very unlikely						very likely
a.) Feel interested in the new challenge and a little nervous at the same time.	1	2	3	4	5	6	7
b.) Feel excited about the higher status and salary that is involved.	1	2	3	4	5	6	7
c.) Feel stressed and anxious about the upcoming changes.	1	2	3	4	5	6	7

APPENDIX H

Appendix H

Informed Consent Form

Research conducted under the auspices of the University of Oklahoma-Norman Campus.

You are being asked to participate in a study examining trainee motivation. This study is being conducted by Jason E. Jones M.Ed. who is a doctoral student at the University of Oklahoma in the Department of Educational Psychology. If you choose to participate in this study you will be asked to complete a set of questionnaires and a demographics form. The amount of time required to complete the questionnaires and the demographics form will be approximately 20-30 minutes. I will also be collecting your performance scores for this course. Your data will be kept completely confidential. I will be using the questionnaires to see if your responses are related to course grades, so I am also requesting to use each student's grades for this training course.

All information I obtain about you in the course of the study will be kept completely confidential. An identifying number will be assigned to each student and the grade information will be linked to the questionnaire information by this number. Such a procedure is used to make sure that your opinions and other information about you is not associated with your name. All information derived from the study will be reported in terms of those numbers and group findings, never in terms of individual names. Neither your instructor nor the United States Postal Service Training Center will have access to your questionnaires.

Your participation in this study is voluntary and there will be no penalty should you decide not to participate. However, we believe your participation will provide valuable insight about how to create a positive environment for effective training. Should you change your mind about participating once you have begun, you may withdraw at any point. There is no psychological or physical risk associated with your involvement in this project. Your questionnaires will remain completely confidential.

If you are willing to participate in this study please print and sign your name on the lines provided below. Dr. Barbara Greene is the faculty sponsor for this project and you may reach her at 325-1534 with any question about the research. For more information regarding the research you may contact Jason Jones at 842-5598. You may contact the office of research administration at the University of Oklahoma at 325-4757 with any questions about your rights as a research participant.

You must be 18 years of age or older to participate.

> I consent to participate in this research project about training and student motivation, that will require me to fill out surveys and allow the researcher access to my examination scores.

Your Name: _____
PLEASE PRINT

Your Signature: _____

Date: _____